

NILA BANTON SMITH

Be a Better Reader

BOOK

II

CANADIAN EDITION

MARION D. JENKINSON

JEAN E. ROBERTSON

PHYLLIS C. SUTHERLAND

CURRICULUM

SKILL DEVELOPMENT IN READING

Literature

History and Geography

Science

Mathematics

PRENTICE-HALL OF CANADA, LTD.

Be a Better Reader • II

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CANADIAN EDITION

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TO THE TEACHER

This book is designed (1) to improve the basic common skills needed in reading all types of material and (2) to develop special skills needed for effective reading in the areas of science, social studies, mathematics, and literature.

The unit topics were selected because of their appeal to teen-agers and because of their frequency of occurrence in junior high and high school textbooks. The skills are those most often needed in studying text and reference books at these levels. The special vocabularies include words common to the most widely used high school texts in science, social studies, and mathematics. Because of these features, this book should fit into and reinforce the curriculum of the average high school. It can be used effectively for either developmental or remedial instruction.

In the preparation of the Canadian Edition, some selections have been substituted, where applicable, in order to provide a Canadian setting. However, the philosophy of the original series as developed by Nila Banton Smith remains unchanged. The Canadian Edition has retained the developmental sequence of reading skills and the format and types of questions of the original series.

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The *Teacher's Guide* which accompanies this book contains explanations of skills, page-by-page procedures, additional activities, and answers to all activities in the text.

The material in this book provides advances over Book I of the series in these respects: readability level, depth of concept, complexity of application, reintroduction and reinforcement of skills given practice in Book I, and introduction of a variety of additional skills needed in different subject fields. Book II is especially valuable for its emphasis on study aids designed to prepare students to work with the more difficult types of reading content with which they will be confronted in the years ahead. Included are exercises in outlining, organizing, making tables and diagrams, taking notes, writing summaries, preparing reports, referring to maps and diagrams, scanning for special information within a text, and locating related information outside of the text. A special feature is the wealth of material designed to improve the student's skills in pronouncing and understanding unfamiliar words.

Particular effort has been made to produce a text and *Teacher's Guide* so self-contained that they can be effectively used by a teacher without special training either in reading instruction or in subject areas apart from the teacher's own field of specialization. Selections in science, history, and social studies are complete in themselves, insofar as technical subject-information is concerned; those mathematical processes which the teacher may have forgotten are explained in the *Teacher's Guide*. A section on general procedures, complete with a report of a reading lesson, has been provided. Since many teachers report that they are using each BE A BETTER READER book with a variety of grades, a discussion of special adjustments has been made as seemed necessary for simplified scoring of the activities.

A detailed listing of the specific common skills and skills in special subjects developed by BE A BETTER READER, BOOK II, may be found in Chapter II of the background material in the *Teacher's Guide*.

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For a list of topics and selections, see inside back cover. For teaching procedures and answers to activities, see the *Teacher's Guide* for Book II.

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TO THE STUDENT

The people who have written the textbooks that you are using in other subjects have taken it for granted that you are a better reader this year than you were last year. They have used longer sentences and paragraphs and have included many new words which you will be expected to pronounce and understand readily. They have introduced complicated new ideas and facts and processes. They have given you longer assignments. Problems, questions, and tests are harder, too.

This book has been planned to help you BE A BETTER READER so that you can meet all of these challenges. If you study it carefully, you will find that you can improve your reading skills, which will contribute to raising your grades. There is no end point to how much you can improve your reading. No matter how well you can read now, you can always learn to read better.

If you have used Book I of the BE A BETTER READER series, you have become acquainted with some of the basic reading skills needed in reading at the secondary level. You have had practice in using these skills. Book I alone, however, does not provide sufficient practice to ensure a high level of skill in reading the more difficult material with which you are working now. High achievement in reading, like high achievement in basketball or tennis, comes with continued and intensive practice in using different skills in different situations. In this book you will have more practice with the different skills introduced in Book I, and you'll be able to use these skills with more difficult material. New skills will be introduced, also. As you proceed through the book, you will be given opportunities to measure your increases in achievement.

If you have not had Book I of the BE A BETTER READER series, this would indicate that you have already achieved some proficiency in applying the common reading skills and those skills needed in studying in special subject areas. This being the case, you will have an opportunity in this book to identify these skills more clearly and to practice them. By increasing the ability you already have, you will read with greater ease, speed, and accuracy.

Like Book I, BE A BETTER READER, BOOK II, is divided into nine units. In each of these units you will find an exciting story, a social studies selection, a science selection, and a mathematics selection. By learning and applying the special skills practiced in each of these subjects, you will find your regular work in literature, science, social studies, and mathematics easier and more accurate. Each unit also gives you experience in the *basic* skills that you can use in all your reading.

BE A BETTER READER, BOOK II, has been planned to give you special help with study aids which will make the reading of difficult material easier for you. You'll have practice in outlining, organizing, making tables and diagrams, taking notes, writing summaries, preparing reports, using maps and diagrams, scanning, and locating related information outside of your texts, as well as practice in using special skills in working with different subjects. Special help is also given to aid you in pronouncing and understanding new words.

You can read just as well as you want to. Set your own standards, then start at once to achieve them.



UNIT ONE

THE AIR AGE



Read the story below just for enjoyment. Live through the story with Chip and think how you might have felt and what you might have done if you had been in Chip's place.

You will enjoy the story more if you know all of these words:

A person who operates a motor vehicle for pay is called a *chauffeur* (shō fûr').

A person jumping out of an airplane can come to earth safely in a *parachute* (pār' à shōōt).

A pilot saw flames in his plane and tried *desperately* (dēs'pēr it lī) to put them out.

A decision or an opinion reached by reasoning is called a *conclusion* (kōn klōō'zhūn).

CHIP BROWN, JUMPER *

The big man with the hawk nose and the fierce blue eyes grunted as he looked at the boy who stood before him.

"You're Chip Brown? The boy who won that contest by writing an article on airplanes which they ran in the *Times*?" He frowned when he spoke.

The boy nodded. "That's right, Mr. Simpson. The prize was a trip in a plane at this airport and you were to be my pilot." His eager eyes darted to a trim, silver plane on the runway. "Is that the one we're taking, Mr. Simpson?"

The big man jerked his shoulders. "One's the same as another." He muttered under his breath as he led the way to the plane. "Never thought I'd see the day when I'd be acting as a chauffeur for a schoolboy. But that's a part of my job, I guess."

With fumbling hands Chip fastened his seat belt. The big man turned his head and shouted something. Then gracefully, like a silver bird eager for flight, the plane lifted from the ground. They were off!

Far below Chip could see farmhouses and red barns. The shadow of the plane crawled like a huge black beetle across the gold of the fields, high with wheat. Far off, winding between ranches and grape-blue mountains, was the river. It sparkled in the sun, like a thin trail of tinsel fallen from a Christmas tree.

* Adapted from a story prepared for this book by William MacKellar.

Chip's heart was no longer in his mouth. He wasn't scared now. This was fun! He felt like a giant looking down on a world of tiny people—like a bird released from a cage. Then all of a sudden he saw smoke and fierce yellow flames. The plane was on fire!

He opened his mouth to scream to the pilot but there was no breath in his lungs. Anyway he didn't have to scream. The big pilot was already fighting the flames desperately. Finally he gave up the struggle and crawled back to the boy.

"Quick," he yelled, after adjusting the straps on Chip's parachute. "Jump! It's our only chance! Count ten and pull this ring! Hurry!"

All of a sudden Chip was dropping through space. Down—down—down! He tugged at the ring. Nothing happened. The wind smashed against his face. Down—down—while he clawed at the metal piece in his hands. Then suddenly he felt himself jerked up! A huge sigh of relief came from his lips. The parachute had opened at last.

He could see the earth rising in a slow green wave to meet him. He was scared, but not too scared to think. At the speed he was falling he would hit the ground in another ten seconds. What was it he had read he should do then? Relax! That was it! Crumple up and roll over. That way, with a little luck he might escape a bad injury.

The next second he was rolling across the uneven ground until he finally got himself free from his parachute. Gingerly he felt his body. At least he was all in one piece!

It was a few minutes later that he found the pilot. He had landed in a dry ditch and had a badly injured ankle. His face showed his relief when he saw Chip coming.

"You sure had me worried, boy," he said. He tried to get up, but fell back with pain.

"I'll get some water for that ankle," said Chip.

Soon he found a small mountain spring not too far off. Dipping his handkerchief in the ice cold water, Chip hurried back to his patient. Carefully he tended to the badly swollen ankle, then straightened up.

"The river's just ahead. Where there's water there

are usually houses. I'll get help and then come right back."

A half mile up the river Chip found a ranch house. The rancher hurried out with his car and brought the pilot back with him. Now in the warmth of the huge living room Mr. Simpson looked across at Chip. The pilot smiled at his young friend.

"And to think I was complaining about being a chauffeur this morning. Just shows one should never jump to conclusions." He laughed. "Especially about a *real* jumper."

Chip felt his face crimson with pride. "Am I a real jumper, Mr. Simpson?" he asked eagerly.

The pilot nodded. "You certainly are, Chip Brown, and that's not just my conclusion either. That's a fact."

COMPREHENSION QUESTIONS

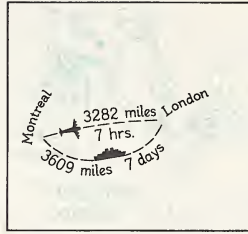
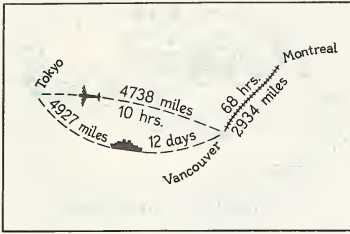
Write answers to these questions to show how well you remember facts in the story.

- 1. What had Chip done to win an airplane ride? _____
- 2. What was the first thing Chip did after getting into the plane? _____
- 3. What did the shadow of the plane look like as it flew over the ground? _____
- 4. What did the pilot do about the fire on the plane? _____
- 5. What did the pilot do for Chip after he gave up trying to put out the fire? _____
- 6. What did he tell Chip to do? _____
- 7. What had Chip read that one should do when he landed from a parachute? _____
- 8. Where did the pilot land? _____
- 9. What did Chip do to the pilot's ankle? _____
- 10. Where did Chip go for help? _____

DISCUSSION QUESTIONS

- 1. What is a "hawk nose"? _____
- 2. Why was the pilot displeased because he had to take Chip for a ride? _____
- 3. Do you think he took the plane that Chip hoped he would? _____ Give your reason. _____
- 4. The story says Chip couldn't scream because there was no breath in his lungs. Was this the real reason? _____ Give your reason. _____
- 5. What was the purpose of the ring that Chip pulled? _____
- 6. Would you have been scared while coming down in the parachute? _____ What would you have thought about on the way down? _____
- 7. The pilot felt differently about Chip toward the end of the story. What changed his attitude? _____
- 8. At what point in the story do you think the pilot began to be sorry that he had complained about Chip's ride? _____

SPEED AND SPACE



Do you think that when your grandfather was a boy, he could have had an airplane ride such as Chip had with Mr. Simpson? The selection below tells you how rapidly airplanes have come into use. Reading it will help you to answer the question about your grandfather.

This selection is like some of the chapters which you find in *social studies* or *history* books. You

should not read it in the same way that you read the story about Chip. Here are instructions for reading this selection:

1. Read the first map. Think about the distance between Vancouver and Tokyo. Compare this distance with the distance between Vancouver and Montreal, which is about 2,934 miles. Compare the time it takes by boat and by plane.

Read the second map in the same way.

2. Read all of the boldface headings in the selection. Think about the big steps in the progress of airplanes. Do Activity 1.

3. After doing 1 and 2 above, carefully read the paragraphs under each boldface heading to find the *cause* which made something happen, and the *effect* or result of that cause.

4. After finishing the entire article, do Activities 2 and 3.

A famous aviator was named Louis Blériot (blā rē ō).

The unfolding of something unknown is called *development* (dē vē'ŭp mēnt).

An important period in history is called an *era* (ē'rá).

If a person is able to do what he sets out to do, he is said to be *successful* (sŭk sēs'fōōl).

The end or outcome of doing something is called the *result* (rē zŭlt').

A notable act or performance displaying skill or daring is called a *feat* (fēt).

THE DEVELOPMENT OF AIRCRAFT

THE FIRST AIRPLANE FLIGHTS

Men always have wanted to fly. Even in ancient times attempts were made to travel through the air, but such attempts ended in failure.

Finally balloons were invented which made successful flights. Later, a great deal of interest developed in the use of gliders without engines. Then came the airplane with a gasoline motor!

The first successful airplane flights were made by Orville and Wilbur Wright in 1903, at Kitty Hawk, North Carolina. Orville made the first flight and stayed in the air twelve seconds. Wilbur made the next flight and stayed in the air almost a minute. The Wright brothers, who repaired bicycles, had made their plane from odds and ends in their workshop. It wasn't until 1908, after they had shown their plane in Europe, that their own countrymen paid any attention to their invention.

That same year, Glenn Curtis made a flight, remaining in the air long enough to travel one mile. After that, one man after another made an attempt, each setting a new record of both speed and distance. In

1909, Louis Blériot, a Frenchman, flew across the English Channel from France to England. This was hailed as a wonderful feat.

WORLD WAR I SPURS INTEREST IN AIRPLANES

Experimenting by inventors might have gone on for years with slow progress had it not been for World War I, 1914 to 1918. When the first plane flew over European battlefields, the whole world began to think of uses to which the airplane might be put in wartime. Many countries tried to improve their airplanes, and an era of great progress took place.

TRAVEL AND INDUSTRY HASTEN AIRPLANE DEVELOPMENT

In 1927, Charles A. Lindbergh, a young airmail pilot, thrilled the world. He flew from New York to Paris in 33 hours and 31 minutes. Businessmen began to recognize the value of air travel when they saw that trips which had taken weeks could be made in days or hours. People began travelling by airplane instead of by train or boat. Farmers found they could ship

foodstuffs great distances in a short time. Industries, too, discovered that airplanes could carry their products from factory to markets both quickly and safely.

The demand which grew for these new services meant a great growth of the airplane industry. New designs for larger, safer, and faster planes were developed. New landing fields sprang up. Runways were enlarged. Many people had to be hired to run the planes. Many people were also needed to work at other industries which came into being with the manufacturing of airplanes.

NEW DEVELOPMENTS DURING WORLD WAR II

During World War II, 1939 to 1945, the airplane became very important in warfare. Many new planes were developed to serve different purposes: transport planes, fighter planes, bombers. Jet fighters with speeds of over 600 miles per hour were developed

during this period. These new-type planes came as a result of World War II.

PRESENT STRUGGLE FOR SPEED AND DISTANCE

Since the close of World War II there has been much more work with jets. Jets have been developed that travel many times faster than sound. Jets are replacing older kinds of airplanes for many purposes of travel and industry.

In spite of all these developments in airplanes, however, man is not satisfied. He wants to go faster and farther. This fact accounts for the strong interest at present in developing rockets. Invented by Professor Goddard in 1926, rockets today are extending the reach of man millions of miles into space. With rockets, man is learning more and more secrets of the universe. This knowledge may someday make it possible for you, yourself, to look upon wonders that no man before you has seen.

ACTIVITY 1—SUMMING UP BOLDFACE HEADINGS

The boldface headings summed up the five important periods in airplane development. Write the names for the first four periods. Use your own words if you like. Do not refer to the article.

First Period: _____

Second Period: _____

Third Period: _____

Fourth Period: _____

ACTIVITY 2—FINDING CAUSES AND EFFECTS

1. What caused men to invent balloons, gliders, and airplanes in the first place? _____

2. What caused new interest to develop in airplanes between 1914 and 1918? _____

3. What were some effects on the airplane industry of the use of planes to carry travellers and freight? _____

4. What is the cause of man's present interest in improving rockets? _____

ACTIVITY 3—REMEMBERING DATES

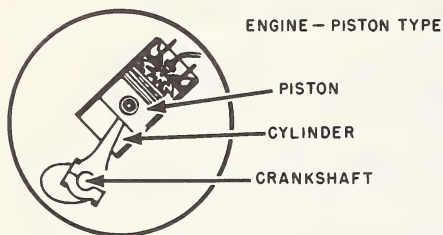
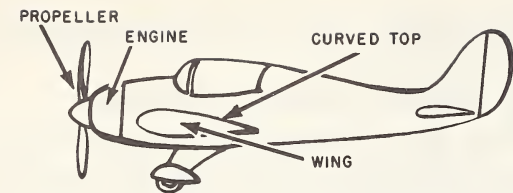
Ask your teacher how to make a time line showing important dates in aircraft history.

Applying What You Have Learned About Reading in Social Studies

When starting to work with a new chapter, read all of the boldface headings before reading the chapter as a whole. These headings will tell you the important things with which the chapter deals. This preview helps you to grasp the big points.

If the chapter deals with causes and effects, read the paragraphs under each boldface heading to find out what caused the event to happen, or progress to take place, and what effects resulted. This will help you to gather the important points.

WHAT MAKES AN AIRPLANE FLY?



Chip wrote an article entitled "What Makes an Airplane Fly." Could you write an article on this topic? You can learn something about the subject by reading the selection below.

This is a *science* selection, and you should read it differently than you read the story about Chip or the *social studies* selection. This selection explains processes which make an airplane fly.

The instructions tell you how to read this selection

The fanlike device in an airplane which forces air backward is called the *propeller* (prô pēl'ēr).

An engine has several round chambers, each of which is called a *cylinder* (sīl'īn dēr). It is in a cylinder that the piston receives impact from the gas or steam.

and any other *science* material that describes a process.

1. Study the diagram. Read the names of the parts. Then try to name these parts on the diagram without rereading the labels.

2. Read all of the boldface headings in the selection to find out what three different kinds of processes will be described.

3. Read the section under the first heading. Read just one sentence at a time and think about it. Look back at the diagram often to find the part or parts of an airplane mentioned. Try to understand just how these parts work, as described in the sentences.

After reading the entire section in this way try to explain to yourself without looking at the book just how the process takes place.

4. Read each of the other sections in the same way that you read the first one.

5. Do Activities 1 and 2 on page 7.

A shaft which is turned by a crank is called a *crankshaft* (krängk'shäft').

A very small amount of matter made up of two or more atoms joined together is called a *molecule* (mōl'ē kül).

HOW AN AIRPLANE WORKS *

Men who invent or improve airplanes must have a great deal of scientific information. They must know many facts about the air, and they must understand how machinery works. Some of the information which these men know so very well is explained to you in this selection.

WHAT MAKES AN AIRPLANE STAY UP?

There is air all around our earth, up to a height of about 500 miles. This air presses on all objects. It presses equally hard downward, upward, and sideways. Suppose that you could find some way of lessening the downward pressure of the air on this book. Suppose at the same time that the upward pressure were increased. The book would be lifted upward, right out of your hands! The wings of airplanes are shaped to make this happen.

The top of each wing is arched, while the bottom is flat. As the plane rolls along the ground, the air

rushes over both the top and the bottom of the wing. You can see that the air rushing along the top has a longer way to go to reach the back of the wing because it must travel over the arch. You might expect that this air would take longer in getting to the back, but it doesn't. It gets there at exactly the same time as the air at the bottom. That means it must have moved faster, for it had a longer way to go. This faster movement lessens the air pressure on top of the wing. As the plane races faster and faster along the ground, the air pressure on top of the wing decreases so much that the plane is pushed upward into the air. This upward push is called "lift."

Most of the lift of an airplane wing comes from the arched top of the wing. However, the wing is set at a slight upward slant, so that the air hitting the bottom causes some lift there, too. As long as the plane keeps moving forward fast enough, the lifting force will keep it up in the air.

WHAT MAKES AN AIRPLANE MOVE?

In most small airplanes, one propeller with two or

* Based upon material prepared for this book by Leo Schneider.

more blades pulls the plane along. Some large airplanes have four or more propellers.

If you look at the diagram carefully, you will see that the propeller blades are twisted. To move a plane, you must first start the motor. Then the propeller blades spin, and the twist pushes the air *backward*. This forces the airplane *forward*. When the propeller spins very fast, the forward force pulls the plane along at high speed.

HOW IS THE POWER PROVIDED?

Power from a gasoline engine causes the propeller to spin. The engine is made up of a number of *cylinders*. Each cylinder looks like a soup can with one end removed. Inside the cylinder is another “can,” called a *piston*. The piston is just a tiny bit narrower than the cylinder, so that it can slide back and forth inside the cylinder. The bottom end of the piston is

attached to a *crankshaft*, which is forced to go round and round by the sliding of the pistons. The propeller is at the end of the crankshaft, so it spins round and round, too.

The pistons operate according to a *four-stroke cycle*. The first stroke, the *intake* stroke, is a downward movement of the piston that draws a gas-air mixture into the cylinder. The second stroke, the *compression* stroke, is an upward movement of the piston that squeezes the mixture into the top of the cylinder. At the end of this stroke, the spark plug shoots a spark into the gas-air mixture. The *expansion*, or power, stroke follows. The spark causes the compressed gas-air mixture to explode and push the piston downward with great force. The piston then turns the shaft, which turns the propeller, which moves the plane. The fourth, *exhaust*, stroke of the piston is an upward movement to push the burned gases out of the cylinder.

ACTIVITY 1—DRAWING AN AIRPLANE WING

1. In the space below draw an airplane wing with the arched top and the slight upward slant of the flat bottom.
2. Draw a dotted line showing the path travelled by air rushing over the top of the wing.
3. Draw another dotted line showing the path travelled by air rushing under the wing.

4. Explain why air pressure is less on top of the wing: _____

ACTIVITY 2—EXPLAINING A PROCESS

Explain what the propeller does in making the airplane move from the time the engine is turned on until the plane is moving very fast.

1. _____
2. _____
3. _____
4. _____

Applying What You Have Learned About Reading Science

When you come to a section in a *science* textbook which explains a machine or describes a process, make up your mind to do some *very* careful reading. Read and study the material in much the same way that you read and studied the selection about airplanes.

1. Study any diagram that is given. Read the names of parts. Then see if you can name the parts without reading their names.

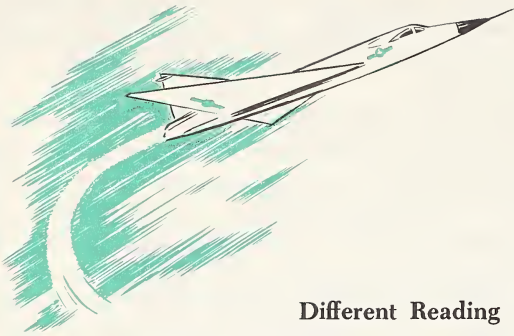
2. Read all of the boldface headings to find out what different things will be explained.

3. Read the paragraph under the first boldface

heading. Read one sentence at a time, think about it, and be sure you understand it. Look back at the diagram often after you have read a sentence to see if you can get a better “picture” of what the sentence said. When you have finished, see if you can explain the machine or process to yourself.

4. Continue in the same way until you have read each of the sections.

5. In reading *science* material of this type, you will often find it helpful to draw a diagram or to write the steps of a process in your own words as you did in Activity 2.



HOW FAR AND HOW FAST?

In reading about airplane travel, we often find that numbers are mentioned. Working arithmetic problems with these numbers usually gives us deeper meanings and insights than we might otherwise get.

Different Reading Skills Are Needed in Mathematics

Many students have trouble with mathematics because they don't know how to *read* mathematics. Mathematics calls for procedures and skills that are different from those needed in reading literature, social studies, or science.

First of all in reading *mathematics*, you must know *exactly* what the special words and terms mean. If you're told to work with nautical miles and you don't know what they are, find out before you do anything else. Next, remember that abbreviations (mph, cu. ft., A.) and symbols ($+$, $=$, π , y^2) are a special language that you must understand just as well as the words. Look up any abbreviations or symbols that you don't know.

Then, too, be prepared to move your eyes up or down on the page as often as you move them from left to right. Once you have read a problem straight through and know that you understand it, you should be able quickly to pick out the sentence that asks or tells you to find something, glance at the lines of print to select the numbers that you need, look at a preceding page if necessary to choose a formula that will help you.

Another thing to remember is to use sample problems, diagrams, charts, and other illustrative material. Also, when a new topic or process is introduced, be sure to read and reread the explanation until you can repeat it to yourself without looking at the page. When you are ready to apply this explanation to problems, work slowly and carefully, step by step, until you are sure you have the procedure exactly right.

In short, mathematical reading calls for *exactness*, *order*, *flexibility*—and, once you're sure of yourself, *speed*.

The mathematics selections in this book have been planned to help you develop, maintain, and increase all of these mathematical *reading* skills. Many of the early selections are concerned with arithmetic problems because such problems will give you the greatest variety of mathematical reading experience. If you're already studying aspects of algebra, geometry, or other advanced mathematical subjects, you should find that the exactness, order, flexibility, and speed that you develop in working with problems in this book will carry over.

When you need to work a problem, especially one in which you are to apply a new process, you will find an orderly procedure such as the following to be helpful.

1. *Read* the entire problem carefully enough to understand it fully. Take the time you need.

2. *Read* again the sentence in the problem that asks you or tells you something.

3. *Read* the entire problem to answer the question: What facts are given me with which to work?

4. Decide what processes to use. As a result of all the *reading* you have done, decide whether you are to add, subtract, multiply, or divide, or to use some combination of these processes.

5. Estimate your answer. Try to think of a sensible answer just by looking at the numbers and *thinking what the words and sentences in the problem tell you to do with these numbers*.

After doing all of these things in which you use *reading*, you are finally ready to work the problem. At this point you may continue as follows:

6. Set the figures down on paper and make your computations carefully.

7. Compare your answer with the estimate that you made while reading the problem.

8. Check your computations.

Naturally, a student who is good at mathematics won't need to reread as much as a student who has trouble with this subject. For instance, a good student is often able to pick out at a glance the numbers that he or she needs to use in a problem. If you are one of these fortunate students, you may use the problems and exercises that follow, on these and later pages, to develop greater speed. See how rapidly you can answer the questions and compute the problems without making a single mistake. If you are a student who has trouble with problems, however, don't try to work for speed until you find that you are giving the right answer to each question.

The exercises on the next page* will give you practice on the first two procedures that have been discussed. Later you'll have a chance to work with the others. The first question has been answered as an example.

* Based upon material prepared for this book by Donald Lentz.

PROBLEMS ON AIR TRAVEL

1. A recent report shows that a total of 11,630,364,000 passenger-miles were flown by United States airlines in a half year. What was the average number of passenger-miles flown per month?

What are you to find? Average number of passenger - miles per month

2. A certain plane was loaded with 12,000 lbs. of gas at the airport. The gasoline weighed approximately 7.2 lbs. per gallon. The plane could travel 1 mile on a gallon. About how far could the plane travel on the 12,000 lbs. of fuel?

What are you to find? _____

3. Early airplanes could not fly over the higher mountains between Vancouver and Calgary. Their roundabout route between these two cities was 550 miles. Modern planes which can fly high over the mountains go in a direct route of 415 miles. The early airplanes flew about 200 miles per hour, and the modern airplanes fly about 500 miles per hour on this trip. How many hours and minutes are saved per trip?

What are you to find? _____

4. The first airplane engine used by the Wright brothers weighed 170 lbs. and produced 12 horsepower. One modern piston-type engine weighs about 1.3 lbs. for each horsepower it produces. Did the Wright engine weigh more or less than 1.3 lbs. per horsepower? How much more or less?

What two things are you to find?

a. _____

b. _____

5. A recent report shows that a total of 1,828,902,000 passenger miles were flown by Trans-Canada Airlines in one year. What was the average number of passenger miles flown per month?

What are you to find? _____

6. A manufacturer built 15 jet-liners for a company. It cost the manufacturer \$87,000,000 to build these planes. What was the average cost per plane?

What are you to find? _____

Sum up what you are asked to find in each of the 6 problems in another way. Write what you are to find in each problem on the line opposite the number of the problem.

Problem

Find

- | | |
|----|-------|
| 1. | _____ |
| 2. | _____ |
| 3. | _____ |
| 4. | _____ |
| 5. | _____ |
| 6. | _____ |

If you have time, you may compute the problems on a separate piece of paper.

Applying What You Have Learned About Reading Problems

Whenever you start to read a problem in your *mathematics* book, do two things first of all:

1. Read the entire problem carefully enough to understand it as a whole.

2. Concentrate on the sentence that asks you or tells you to find something. Make *very* sure that you know what it is that this sentence asks you or tells you to find. This is the key to the problem.

REVIEWING VOWELS

Do you still have trouble in working out the pronunciation of many of the new words which you meet in your reading and study?

There will be large numbers of new and difficult words in the books that you will use this year. Although you will need to look up some of these words in a dictionary or glossary, it takes time to look up *all* of them. You should be so skilful in working out word pronunciations that you can do this by yourself at the time that you first meet the words on the pages of your books.

It is a good thing to take stock at this time of the year to find out just how much you do know about pronouncing words, and what you don't know.

One of the most important things for you to know is the sounds of different letters and groups of letters. You have had work with sounds of letters in the past. Perhaps you have forgotten about this work or have become careless in using it. So sounds will be reviewed in this book.

You know, of course, that the vowels are a, e, i, o, u, and sometimes y.

Finding Words That Begin with a Vowel

In each of the boxes below there is one word that begins with a vowel. Find that word in each box and underline it.

1. ankle rocket silver	2. plane invent beetle	3. effect ranch scream	4. fact river odd
5. engine transport reason	6. flight travel era	7. product design unit	8. glider industry balloon

Finding Words That End with a Vowel

In each of the boxes below there is one word that ends with a vowel. Find that word in each box and underline it.

1. subject process extra	2. waste diagram section	3. movement propeller coffee	4. crank piston saliva
5. plasma demand bomber	6. recent modern cacti	7. problem special radio	8. travel volcano material

Finding Words with One Vowel in the Middle

In each of the boxes below there is one word that has only one vowel in the middle of the word, and no vowel at the beginning or end. Find that word and underline it.

1. purpose helpful jet	2. stand result plane	3. market value ton	4. rapid grunt flee
5. chapter refer win	6. glider dip serve	7. travel later skill	8. sum gallon sorry

REVIEWING THE LONG AND SHORT VOWEL SOUNDS

You will remember that the most common vowel sounds are the *long sounds* and the *short sounds*. Key words are given for these in the table to the right. When you look up words in a dictionary you sometimes find a bar above a vowel, like this: a. This means that the vowel is long. A vowel in the dictionary has the short sound if it has a curved line above it, like this: a.

Long Sounds

1. a as in ate
2. e as in be
3. i as in like
4. o as in rose
5. u as in mule
6. y as in cry (kri)

Short Sounds

7. a as in at
8. e as in bed
9. i as in sit
10. o as in hot
11. u as in cut
12. y as in crystal

Below are words containing long or short vowels. Referring to the table above, write the number of the long or short vowel sound in the space at the left of each word. Then place the right mark above the vowel. Respell y as i in parentheses after the word, and add the appropriate mark.

Mark Long or Short a

- | | |
|----------------|----------------|
| 1. _____ age | 6. _____ rash |
| 2. _____ land | 7. _____ able |
| 3. _____ strap | 8. _____ game |
| 4. _____ save | 9. _____ back |
| 5. _____ lake | 10. _____ plan |

Mark Long or Short e

- | | |
|----------------|-----------------|
| 1. _____ best | 6. _____ press |
| 2. _____ we | 7. _____ helium |
| 3. _____ fed | 8. _____ tend |
| 4. _____ cedar | 9. _____ dehorn |
| 5. _____ rest | 10. _____ fed |

Mark Long or Short i

- | | |
|---------------|----------------|
| 1. _____ tin | 6. _____ whip |
| 2. _____ lick | 7. _____ pick |
| 3. _____ size | 8. _____ price |
| 4. _____ fish | 9. _____ mild |
| 5. _____ time | 10. _____ mine |

Mark Long or Short o

- | | |
|----------------|----------------|
| 1. _____ mold | 6. _____ choke |
| 2. _____ flock | 7. _____ from |
| 3. _____ snow | 8. _____ rode |
| 4. _____ job | 9. _____ box |
| 5. _____ gold | 10. _____ spot |

Mark Long or Short u

- | | |
|----------------|-----------------|
| 1. _____ use | 6. _____ drug |
| 2. _____ pup | 7. _____ rudder |
| 3. _____ rush | 8. _____ union |
| 4. _____ fuel | 9. _____ husky |
| 5. _____ value | 10. _____ thus |

Respell y and Mark Long or Short

- | | |
|-----------------|------------------|
| 1. _____ fly | 6. _____ typhus |
| 2. _____ hymn | 7. _____ try |
| 3. _____ system | 8. _____ physics |
| 4. _____ why | 9. _____ sky |
| 5. _____ lymph | 10. _____ rhythm |

REVIEWING CONSONANTS

Words are made up of both vowels and consonants. It is just as important that you quickly recognize consonants as it is that you be familiar with vowels.

You have just reviewed the vowels: a, e, i, o, u,

and sometimes y. You know, of course, that all of the other letters in the alphabet are consonants. See how quickly you can recognize the consonants when you see them.

Recognizing Consonants

Draw one line under each consonant in the alphabet below.

a b c d e f g h i j k l m n o p q r s t u v w x y z

Write the consonants here: _____

Checking Yourself on the Sounds of Consonants

The name of each picture below begins with a consonant sound.

Look at each picture. Say its name to yourself.

With what sound does the name start? Find the letter beneath the picture that stands for that sound. Draw a circle around it.

1.  <u>l</u> <u>t</u> <u>k</u>	2.  <u>b</u> <u>n</u> <u>f</u>	3.  <u>m</u> <u>j</u> <u>r</u>	4.  <u>d</u> <u>m</u> <u>v</u>
5.  <u>b</u> <u>n</u> <u>d</u>	6.  <u>r</u> <u>h</u> <u>l</u>	7.  <u>s</u> <u>f</u> <u>w</u>	8.  <u>v</u> <u>s</u> <u>w</u>
9.  <u>l</u> <u>t</u> <u>k</u>	10.  <u>b</u> <u>s</u> <u>n</u>	11.  <u>m</u> <u>r</u> <u>h</u>	12.  <u>d</u> <u>z</u> <u>v</u>
13.  <u>b</u> <u>r</u> <u>d</u>	14.  <u>n</u> <u>h</u> <u>k</u>	15.  <u>s</u> <u>p</u> <u>w</u>	16.  <u>v</u> <u>z</u> <u>w</u>

Did you miss the sounds of any of the consonants with which the names of the pictures begin?

If so, think of as many words as you can which

begin with each sound you missed. Make a list of words for each sound and think of the sound of the beginning consonant as you write each word.

Consonant Sounds at the Ends of Words

In the test you just took, you were to circle only the consonant with which the word *began*. It is important also that you know the sound of a consonant when it comes at the *end* of a word.

Say the names of the pictures in each of the boxes below. Find pictures of two words in each box in which the same letter sound comes at the beginning

of one of the words and at the end of the other. Write this letter after the picture whose name *begins* with the letter and write *B* after it. Write the letter after the picture whose name *ends* with the letter and write *E* after it. The work is done for you in the first box. T is the consonant with which *tiger* begins, and it is the consonant with which *cat* ends.

1. <u>t</u> B <u>t</u> C _____	2. _____ _____ _____	3. _____ _____ _____	4. _____ _____ _____
5. _____ _____ _____	6. _____ _____ _____	7. _____ _____ _____	8. _____ _____ _____
9. _____ _____ _____	10. _____ _____ _____	11. _____ _____ _____	12. _____ _____ _____

If you missed any of the sounds above, make a list of words that begin with each sound you missed, and a list of words that end with these same sounds. Think about the sound of the beginning and ending consonant in each list.

APPLYING VOWEL PRINCIPLES

You know these vowel principles:

1. When a one-syllable word contains two vowels one of which is final e, the first vowel is usually long and the final e is silent, as in *spade*.

2. When there is only one vowel in a word and that vowel does not come at the end of the word, the

vowel is usually short, as in *flat* or as in *mud*.

3. When two vowels come together in a one-syllable word, the first vowel is usually long and the second vowel is usually silent, as in *hail*.

See if you can apply these principles in the work below.

Numbering Words

Number each of the words below according to the number of the principle that applies to it.

- | | | | |
|-----------------|----------------|----------------|----------------|
| a. _____ score | g. _____ luck | m. _____ treat | s. _____ spore |
| b. _____ groan | h. _____ goal | n. _____ Jane | t. _____ free |
| c. _____ phrase | i. _____ fact | o. _____ midst | u. _____ case |
| d. _____ team | j. _____ sweep | p. _____ may | v. _____ base |
| e. _____ task | k. _____ ray | q. _____ whole | w. _____ fail |
| f. _____ beast | l. _____ game | r. _____ dim | x. _____ rate |

Writing Words

Several pairs of vowels represent the same long sound, for example:

ay, ai, and ey all sound like long a in *hay*, *tail*, *they*.
ea, ei, and ee all sound like long e in *each*, *receive*, *sheep*.

oa, oe, ou all sound like long o in *coat*, *Joe*, *soul*.
ie, uy both sound like long i in *die*, *buy*.

Write each of the words below under the heading that represents the sound of the two vowels that come together within the word.

- | | | | |
|----------|-------------|-------------|-----------|
| 1. treat | 7. strain | 13. failure | 19. trail |
| 2. coal | 8. pie | 14. leap | 20. creek |
| 3. speed | 9. leave | 15. replied | 21. guy |
| 4. avail | 10. defeat | 16. tie | 22. hoe |
| 5. dried | 11. grain | 17. oats | 23. lie |
| 6. roam | 12. contain | 18. dough | 24. gourd |

Long a Sound

_____	_____
_____	_____
_____	_____

Long o Sound

_____	_____
_____	_____
_____	_____

Long e Sound

_____	_____
_____	_____
_____	_____

Long i Sound

_____	_____
_____	_____
_____	_____

WORKING WITH SCIENCE WORDS

The words and phrases below are in all of the most recent of the *science* textbooks. These words and phrases are either very new in the field of *science*, or have recently come into common usage in this field.

Study the pronunciation of each of these words or phrases. Refer to the key at the bottom of the page if necessary. Say each word to yourself, pronouncing it distinctly. Then read the meaning of the word or phrase and think about it.

antibiotic ăn'ti bī ōt'ik	A substance usually made from a mold and used to kill germs.
antibodies ăn'ti bōd'iz	Chemicals in the blood which act against germs.
aureomycin ô'rē ō mī'sin	An antibiotic used to fight typhoid and other disease germs.
Bakelite bā'kē lit	A plastic that will not burn, used for making phonograph records, among other things.
cortisone côr'ti sôn	A substance used in treating rheumatism.
detergent dê tûr'jěnt	A cleanser used in place of soap.
fluorine flō'ō rēn	A substance placed in drinking water to prevent tooth decay.
hormones hôr'mōnz	Chemicals made by glands in the body.
irradiation ĩ rā'dĩ ā'shŕn	Exposure of a substance, as milk, to rays to add vitamin D.
plastic plās'tik	A substance manufactured in industry which can be shaped when hot and which becomes hard when cooled.
poliomyelitis pōl'ĩ ō mĩ'ē lĩ'tis	A disease often called "polio" or "infantile paralysis."
Salk, Jonas saulk, jōn'ūs	The doctor who discovered a vaccine for poliomyelitis.
streptomycin strēp'tō mĩ'sin	An antibiotic used in treating tuberculosis and other germ diseases.
synthetic textiles sĩn thēt'ik tēks'tilz	Cloth made from raw materials which are neither from animals nor plants. Nylon, for example, is made of materials found in coal, air, and water.
virus vĩ'rūs	The smallest living thing, which causes diseases.

You will meet them very frequently in your reading both in and out of school. Several of them are also used in the next unit. Make sure you know how to pronounce these words and what they mean.

See how well you understand the meanings of the words you have been studying. Choose one of the words to write in each blank. Add g if necessary.

1. Jim never seemed to have germ diseases. The _____ in his blood acted strongly.
2. Mrs. White was given _____ for her rheumatism.
3. Glands produce various _____.
4. Substances made for the purpose of killing germs are called _____.
5. Harold was ill because he had in his bloodstream the smallest living things that can cause sickness. He had a _____ disease.
6. When Mr. Steele had tuberculosis he was given _____.
7. Mr. Stern had typhoid fever. He was given _____.
8. The name of the man who discovered a vaccine for polio is _____.
9. The scientific name for polio is _____.
10. Many cities are putting _____ in drinking water to prevent tooth decay.
11. Vitamin D milk has undergone _____.
12. Some of the new cleansers are called _____.
13. Combs, dishes, book covers, and many other articles are made from a substance which can be shaped while hot and which becomes hard when cool. This substance is _____.
14. Phonograph records are usually made from a non-burnable substance called _____.
15. Clothes are often made from _____.

HOW TO READ FAST

You will have a great deal of reading to do in your grade this year. You can do more of it in less time if you learn to read rapidly.

Perhaps you have been told about some habits which keep a person from reading fast and have been strongly urged to break any of those habits which you might have.

Do you still have any of these bad habits? Check yourself by answering "Yes" or "No" to these questions:

- _____ 1. Do you move your lips when reading silently?
- _____ 2. Do you point to words with your finger as you read?
- _____ 3. Do you move your head from side to side as you read?
- _____ 4. Do you often go back over a line of print because you think you've missed something?
- _____ 5. Do you read one word at a time?

If you answered "Yes" to any of these questions, start at once to break the habit.

If you move your lips, hold your finger over them, or hold a piece of paper between your lips while you are reading. Then if your lips move you will know it and can stop them.

If you point to words, hold the two sides of your book, one side with your left hand, the other side with the right hand. Then you won't have a free finger to use in pointing while reading. If you move your head, place your chin in one hand, and hold your head still.

If you glance back often, it may be because you can't pronounce some of the words or because you don't get the meaning of certain words or phrases or sentences. The work which you do in this book in word pronunciation and meanings should help you in meeting this problem.

If you read no more than one or two or three words at a time, you need to work especially hard in learning to take in more words at each glance as your eyes travel across the lines of print.

Even if you do read fairly fast now you can learn to read still faster. As you probably have been told, the secret of fast reading is to take in whole groups of words at each glance. Read in thought units and force your eyes along the lines of print as fast as you can make them go. Anyone who practices doing these two things can increase his speed in reading.

The story below is divided into thought units. See if you can read it by taking in each group of words with just one glance.

Before you start reading, place your "Beginning Time" in the space provided for it.

If you are using this book alone, without a teacher to help you with timing, use a watch with a second hand for timing yourself. If you haven't such a watch, perhaps you will find that the school clock has a second hand and you can use that. If you do not have either a watch or a clock with a second hand, do the best you can with a minute hand.

Start on an *even* minute, such as 5 minutes after 10:00 or 20 minutes after 2:00. Write your "Beginning Time" at the beginning of the story and your "Ending Time" at the end.

Beginning time: Hr. _____ Min. _____

Camels in the Cariboo

A modern traveller/in the middle/of British Columbia would be startled/to see a camel/trying to climb the steep, rocky paths/of a canyon. / But a hundred years ago/such a sight/would have been possible.

When gold was discovered/in the Cariboo region in 1858/miners and others/swarmed into the area. Many mining camps/and other settlements/sprang up in places. / Essential supplies/had to be sent/to miners by pack mule. / Mules were used/rather than horses because mules/were surer-footed/on the trails and because/they could carry more/than horses. Each mule could carry/about 250 pounds/of freight. They were not/roped together/or kept under a rein and usually followed/the trail/with little guidance.

A regular schedule/was arranged/so a grazing ground was reached/each night.

One of the mule owners,/Mr. Frank Laumeister, became unhappy/with his mules. / He wanted animals which could haul/more supplies/and which could live on the sparse vegetation/in the rocky regions. The animal/which best fitted/these requirements seemed to be the camel.

Perhaps Laumeister had heard/that some camels had been introduced/into California/by the U.S. Army. As a matter of fact/it seems entirely probable that he got/some of his camels/from California when the U.S. Army/disposed of them. / At any rate he acquired twenty-one camels/in the spring of 1862,

and brought them/up the river by boat/to the head of the trail.

The miners did not believe/the rumors they heard about the camels. / However,/they soon saw camels lumbering up/the long Harrison and Quesnel trails. Each camel carried/a thousand pounds of baggage on its back. / The camels had/both speed and strength, and they often covered/thirty or forty miles a day. They not only needed/little water/but were content with the poor shrubs/and grass found/in this area.

Laumeister looked forward/to becoming wealthy. But soon/his problems began. He did not realize or perhaps he did not think/it was at all important that camels/have a strong stench. / This unusual smell had a peculiar effect/on horses and mules. / One whiff of the camel train/made horses and mules crazy. They kicked and reared and bucked/and often dashed from the narrow trail/into the woods/or fell down

the steep sides/of the stream/into a rushing river. Soon Laumeister found himself/involved in lawsuits with several other packers/who had lost their mules and their baggage.

But his troubles/did not end. The camels were used to walking/on the soft sand/of a desert land. The hard, rough Cariboo rock/wore out their feet and many of the animals/developed big ugly sores. Camels were not as easy/to handle as mules/and often they became cross and difficult. / Their injured feet made them worse. / The men were not used/to them and hated working/with them.

Finally Laumeister was compelled/to sell his camels. He sold some of them/on the coast. / Some went to zoos or circuses. / The remaining camels/were turned loose on Thompson flats/east of Cache Creek. / It seems that no offspring were reared,/but the last camel/lived on in this area until 1905.

Checking Your Speed

Finding your "Total Reading Time." Subtract your beginning time from your finishing time. Suppose you started at 10 minutes after ten o'clock and you finished at 12 minutes and 20 seconds after ten. Then you would find your reading time in this way:

	Hr.	Min.	Sec.
Ending time	10	12	20
Beginning time	10	10	
Total Reading Time		2 min.	20 sec.

Now change the total reading time into seconds:
 $60 \times 2 = 120 + 20 = 140$ seconds.

Finding the number of words per minute. There are 495 words in this story. Use the formula below to find the number of words per minute.

No. words $\frac{495}{140} \times 60 = 212$ words per minute.
No. seconds

Use this same plan in finding the number of words per minute *you* read while working with this article. Write the number in the space at the end of the questions on the story. WPM means "words per minute."

Checking Your Understanding of the Story

While it is important for you to increase your speed of reading, you should never read so fast that you fail to get the meaning.

Write "Yes" or "No" after each of the statements below to find out how well you understand the story "Camels in the Cariboo."

- 1. Frank Laumeister wanted to bring camels to the Cariboo to help in mining gold. _____
- 2. Horses were surer-footed than mules. _____
- 3. Mules had to be guided carefully over the trails. _____
- 4. Twenty-one camels arrived in the Cariboo in 1862. _____
- 5. A camel could carry more baggage than a mule. _____
- 6. The horses and mules were friendly with the camels. _____
- 7. The men found it easier to work with camels than with mules. _____
- 8. Laumeister became involved in lawsuits with other packers. _____
- 9. The camels were sold to zoos and circuses. _____
- 10. Camels still roam the canyons of the Cariboo. _____

UNIT TWO



NORTHLAND ADVENTURE

Here is the story of a brave boy who made a dangerous trip in the snowy Northland. Put yourself in his place and try to live through his thrilling experience with him.

Time yourself in reading this story in the same way that you timed yourself while reading the selection on pages 16 and 17. Read as fast as you can, but not too fast to enjoy the story.

Amak (ä'mūk) is the name of an Indian man.
One breed of dog is called a *Malemute* (mä'lē mūt).

Living through an event is an *experience* (ēks pēr'ī ēns).

A sledge dog is called a *husky* (hūs'kī).

One serious disease of the lungs is called *pneumonia* (nū mō'nī ä).

A medicine made from green mold is called *penicillin* (pēn'ī sil'in).

Dried meat, pounded fine and mixed with fat, is called *pemmican* (pēm'ī kăn).

Beginning time: Hr. _____ Min. _____

LOBO, THE MALEMUTE*

It happened on the morning after a howling arctic blizzard. For three days the snow had swept down from the north across the frozen land and over the lonely hills covered with spruce and pine.

Silence came at last. The dim light of another morning shone through the snow-covered windows of a small trading post. Young Peter Linton heaped logs on the fire and fed the huskies. The cheery smell of smoked meat and spices hung in the air.

Lobo, the big Malemute that Peter was training as a lead dog, stirred suddenly. His head turned toward the door. Silver-tipped ears strained forward. Then he growled.

Peter smiled. "Go to sleep, Lobo. No one would come on a day like this."

But he was wrong. Even as he spoke he heard a strange cry and heavy knocking at the door. The door gave way suddenly. The icy air swept in as a man fell through the door and dropped on the floor.

"Where Mr. Linton?" gasped the old Indian.

"Gone for supplies. What's the matter?"

"Boy sick!" the old man answered, pointing outside to a small sled.

Peter ran outside. He took the small Indian boy in his arms. The boy was burning with fever. His breath came in gasps. "He probably has pneumonia," thought Peter. "Only penicillin will save him."

"Where doctor?" old Amak gasped.

"He left last week," said Peter.

"Boy die!" the old Indian wailed. Peter felt helpless. What could he do? He was all alone at the post and must tend the fire to keep things from freezing until his father returned. By that time the boy would be dead.

"How many dogs you got?" Amak asked.

"Father took the team," Peter replied. "There are only five young ones left—this Malemute, whom I am training for a lead dog, and four Eskimo huskies."

"I take and go with boy to doctor," Amak said.

This was impossible! Between the post and Dr. Glenn's hospital lay one hundred and twenty miles of loose snow and an unmarked trail. It was a job for an experienced musher and a full team of thirteen dogs.

"You'd never get through." Then, seeing the disappointment on the Indian's face, Peter said, "You stay and keep my fire burning. I'll go."

Harnessing the dogs, he started off. Lobo, leading the team, was willing and fast. But he had no trail experience. What if he lost the way?

* Lindquist, Willis, "Beyond Snowshoe Pass," *Story Parade*, November, 1949, pp. 22-27. Copyright, 1949, by Story Parade, Inc. Reprinted and adapted by permission.

For the first hours, they made good time. Then the dogs began to tire. The wind rose. At first Peter urged Lobo on softly, then with shouts and cracks of his whip. Several times they stumbled in the deep snow, and Peter went on ahead, making a path with his snowshoes. His muscles ached. His feet burned where the straps of his snowshoes cut them. But he dared not stop.

The hours passed. Finally, Peter stumbled and fell. He closed his eyes and lay still. It was good to rest, but Lobo licked his face to wake him up.

Peter built a small fire with wood he had brought, and gave each dog a pound of pemmican. Then they started off again. Through the long arctic night they went on, stopping now and then to rest.

When the sun rose over the hills, the dogs stopped before a wooden dock. Peter looked out on a great stretch of glassy ice, swept clean by the wind.

"Great Bear Lake!" he shouted. Now he knew that Dr. Glenn's hospital was just thirty miles across the

lake. But the dogs could not keep their feet on the slippery ice.

Suddenly Peter had an idea. He fastened two timbers to the front of the sled. Putting a blanket between the two poles, he shoved out across the ice, leaving the dogs behind.

The wind caught at the make-shift sail. As the sled started, Peter jumped on the runners. It worked! He was sailing an ice-boat, flying before the wind, using his dragging toe as a rudder.

At last he saw the shore-line ahead and the white front of the hospital. As he came alongside Dr. Glenn's dock, some men ran towards him. That was the last he remembered.

When he awoke, he was in a hospital bed, with Dr. Glenn standing beside him. "The boy?" Peter asked.

"He'll make it, thanks to you," the doctor said. "And your dogs came in a couple of hours ago."

Peter smiled. "Good old Lobo! I knew he'd get here. He'll make the best lead dog we ever had!"

Hr. Min. Sec.

Ending time: _____ _____ _____ No. words 720 $\times 60 =$ _____ WPM
Beginning time: _____ _____ No. seconds

Find the number of words per minute that you read in the same way that you did on page 17. There are 720 words in this selection.

COMPREHENSION QUESTIONS

Write your answers to these questions:

1. What one word told you that this story took place close to the North Pole? _____
2. When Amak first began to talk, Peter thought that he couldn't leave to take the boy to a doctor. Why did he think he couldn't leave? _____
3. What was the solution to the problem of taking care of Peter's work while he was gone? _____
4. How many of each kind of dogs did Peter have? _____
5. How many dogs are needed for an Eskimo team? _____
6. What was the chief danger of using the inexperienced Lobo as a lead dog for this trip? _____

7. What did Peter give the dogs to eat? _____
8. Why didn't the dogs pull the sled across the lake? _____
9. How did Peter meet the problem of crossing the lake? _____
10. Where was Peter when he awoke after reaching the shore line? _____

Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

Write your answers on a separate piece of paper.

1. Which experience would you rather have had, Chip Brown's airplane flight or Peter Linton's dog-team trip? Why?
2. Which do you think was the greater hero? Why?
3. The story said Lobo had no trail experience. What did this mean?
4. At what time in the story do you think Peter was most worried about being able to get to the hospital?
5. What would have happened if Lobo hadn't licked Peter's face when he closed his eyes and lay still?
6. Why did Peter think Lobo would make the best lead dog he ever had?
7. Amak didn't speak English very well. What words did he leave out in this question, "Where doctor?"

YUKON, LAND OF THE YELLOW FEVER



Reading the Map

The selection you are about to read took place in the Yukon. See how much information you can find out about this country by reading the map to the left. It may help you to look at the pronunciation and meaning of the new words before working with the map questions.

1. Name five rivers which flow into the Yukon River. _____
2. Trace the route a traveller could take:
 - a. from Dyea to Dawson in 1900 _____
 - b. from Skagway to Dawson in 1900 _____
3. Estimate the distance from Skagway to Dawson "as the crow flies." _____
4. How far is it from Dawson to the Yukon-Alaska border? _____

Reading a Selection on the Yukon

You found out some information about the Yukon by reading the map. Now you may find out more information which the map doesn't give you by doing a different kind of reading.

1. Read the boldface headings in the selection on p. 21. Think of them in order as one leads to the other in the description of this Yukon event.
2. Each heading was the result of some particular

cause or causes. Nothing would have happened without cause. Read the entire selection carefully for the purpose of finding what caused the situations in each heading.

3. Time yourself in reading this selection. Read it as fast as you can but don't try to use the same speed you used in reading the story. You usually need to read *social studies* selections at a slower rate.

A person who explores to find minerals is called a **prospector** (pros'pek tər).

A piece of land is **staked** (stākt) when the boundaries are marked with sticks to show ownership.

A person who is free from contagion or infection is said to have **immunity** (i mū'nā tē).

The total number of people living in a place is called its **population** (pop'yū lā'shən).

When gold is **panned** (pand) it is washed in a

pan to separate the precious metal from the earth.

When a situation becomes quiet or calm, it **subsides** (səb sids').

Two towns in southern Alaska are **Skagway** and **Dyea** (skag'wā and di ā).

The **Siwash** (sī'wosh) Indians live on the northern Pacific coast.

If a person is doubtful or uncertain about a fact, he is said to be **dubious** (dū'bē əs).

Beginning time: Hr. _____ Min. _____

YELLOW FEVER

Yellow Fever strikes. Yellow fever, a virus disease carried by certain mosquitoes, causes the victim's temperature to rise rapidly. So did the discovery of gold in the Klondike River area cause a burning desire in the hearts of thousands of men and women to obtain gold for themselves. On the 16th of August, 1896, George Carmack and his Siwash Indian wife, Kate, were panning for gold along Rabbit Creek, a fork of the Klondike River, when the rich strike was made. The claim was officially staked the following day and the news spread like an infectious fever.

The fever spreads slowly. Isolated as the Klondike River was, the news took almost a year to reach the outside world. Men in the Yukon and Alaska who heard of the strike rushed to the Klondike, and the whole town of Circle City, Alaska, was abandoned as gold seekers hauled their own sleds over the four hundred silent, frozen miles to the scene of the strike. Some prospectors were dubious and delayed sinking their mine shafts into the frozen ground. Others were too excited and some lacked funds to purchase the equipment to work their claims. All through the winter, however, a number of men worked feverishly thawing out the ground inch by inch, and many of them sank several shafts before they found the yellow pay streak. Most of them never found gold.

The fever rages. Although the initial discovery of gold created great excitement within the limited Yukon-Alaska area, only a few reports reached the outside world. It wasn't until some eighty prospectors returned to Seattle and San Francisco in July, 1897, with sacks of gold dust that the gold fever hit the English-speaking world at large. Estimates gave the population of Yukon at the time of the discovery as 500 white men. By the autumn of 1897, however, 10,000 men passed through Seattle alone on their

way to the Klondike. All together, 100,000 men are believed to have left their homes for the Yukon, but only 40,000 reached the banks of the Klondike River and a mere 4,000 found gold.

To meet the demands for transportation to the north, a vast array of ocean-going vessels, seaworthy and otherwise, were pressed into service. One small steamship with accommodations for 60 stuffed 500 men and an equal number of dogs aboard.

Thousands of men docked at Dyea and Skagway in a desperate attempt to proceed over the Chilkoot and White Mountain passes to the Yukon River before winter. The North West Mounted Police required each man to have a year's supply of food and other provisions, roughly a ton of goods. These goods had to be lugged in stages over the mountain passes. The backtracking left the men exhausted, physically and nervously. Although the distance from Skagway to Lake Bennett and the Yukon River was an estimated 45 miles, many men walked close to 900 miles to pack their goods. Of the thousands of men who tried to get through the passes, only a few were successful. Most of them returned home or waited for spring. Some died on the trail.

The fever subsides. Throughout 1898 men poured into the Klondike. Some became rich, others poor. Some died but most of them survived. As most of the gold had been claimed before the winter of 1898, by the following year the yellow fever had subsided and men by the thousands returned to their homes in the outside world.

Those who recover from the virus disease of yellow fever usually develop a life-long immunity. So it was with those who contracted gold fever. They talked often of their great adventure but few were infected with "yellow fever" a second time.

Hr. Min. Sec.

Ending time: _____

Beginning time: _____

No. words 622
No. seconds _____ $\times 60 =$ _____ WPM

Compute your rate in the same way that you did on page 17.

ACTIVITY 1—CAUSES AND EFFECTS

Write the causes which led to each event.

1. Yellow Fever strikes

Causes:

- a. _____
- b. _____

2. The fever spreads slowly

Causes:

- a. _____
- b. _____
- c. _____

d. _____

3. The fever rages

Causes:

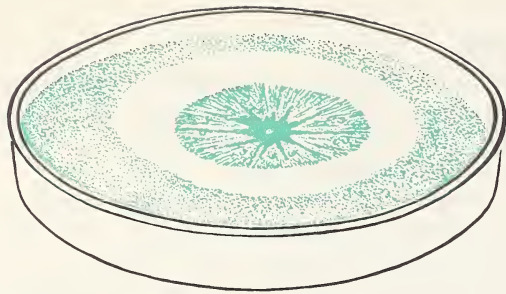
- a. _____
- b. _____
- c. _____

4. The fever subsides

Cause:

- a. _____

Comprehension score: _____ WPM: _____



WONDER DRUGS

Peter thought the Indian boy had pneumonia and that the only thing that would save him was penicillin. Was he right? If so, why would penicillin save the boy? The article below will answer this question.

One of the methods used by scientists is the problem-solving method. They recognize a problem. Then they experiment until they solve the problem. The solution usually brings good results to many people.

The selection below tells how scientists met some problems in regard to penicillin.

1. First read the boldface headings. After reading all of them, see if you can state each of the problems to yourself.

2. Read the three parts of the selection carefully to:

- Review the statement of the problem.
- Find out what was done about it.
- Find out what the result was or what the results were.

Usually one cannot read *science* material as fast as one can read a story or *social studies* material. Sometimes, however, *science* material really tells a story of how scientists have met certain problems. Such accounts often are easy to read and can be read rapidly. See how fast you can read this article and still do the three things mentioned above in covering each section.

The matter of which a thing is made is called its *substance* (sŭb'stāns).

A germ disease affecting the brain and spinal cord is called *meningitis* (mĕn'in jī'tis).

A condition produced by bacteria in the body is called *infection* (in fĕk'shŭn).

Bacteria (bak tēr'ē ə) are very tiny and simple

plants, which are so small they can usually be seen only through a microscope, and which often cause disease.

A *bacteriologist* (bak tēr'ē ol'ə jəst) is a man who studies bacteria.

A medium in which bacteria are being grown is called a *culture* (kŭl'tŭr).

Beginning time: Hr. _____ Min. _____

PENICILLIN *

Scientists have known for many years that some diseases are caused by germs or bacteria. Many scientists have attempted to find substances that would kill these disease-producing bacteria. And several of them have been successful in their attempts.

Among the more recently discovered germ killers are the so-called "wonder drugs." Scientists call these drugs *antibiotics*. An antibiotic is a chemical substance produced by a living thing which can stop the growth of or even destroy bacteria and other disease germs. The best known of these antibiotics is penicillin, which was discovered by Dr. Alexander Fleming, a British bacteriologist.

Dr. Fleming solves a germ-control problem. Dr. Fleming, like many other scientists, had been experimenting with bacteria for some time to learn more about bacteria and especially how to control them. He had placed several bacteria cultures in dishes in his laboratory. One day while looking at one of these cultures he noticed a blue-green growth. It was in

the center of the dish and around this growth there was a clear space. It looked as if the germs could not grow in this space.

Dr. Fleming wondered if there was something in this blue-green mold that prevented the bacteria from growing. He grew more of the mold, which had already been named *penicillium* by scientists. After many experiments he found that this penicillium mold sent out a chemical which prevented some germs from growing. It also killed other germs that had already grown. He called this chemical *penicillin*.

How could penicillin be removed from the mold? While Dr. Fleming had solved the problem of finding a substance to kill bacteria, he was faced with another problem which he couldn't solve. He was not able to remove the penicillin from the mold plant. It was of no use to human beings when it was embedded in the mold.

So Dr. Howard Florey and Dr. Ernest Chain undertook the problem where Doctor Fleming left off. They experimented with the mold and finally were able to obtain a small amount of the penicillin in the

* Based upon material prepared by Irving Zeichner.

form of a white powder. They used this powder in experimenting with rats, and proved that the drug would kill germs. Later they used the drug with some soldiers who had badly infected wounds. The results were very successful.

How could penicillin be produced in large amounts?
At first penicillin was produced only in small amounts in laboratories. It was very expensive and doctors couldn't get enough of this wonderful drug to meet their needs. In order to solve this problem, American

drug companies began building huge 15,000 gallon tanks. In these tanks they placed a special broth in which the mold grows well. With the use of these huge tanks penicillin is now produced in amounts large enough to supply the needs of all.

With the help of this antibiotic, millions of people throughout the world have recovered from diseases. Penicillin is used for pneumonia, meningitis, diphtheria, boils, "blood poisoning," infections in different parts of the body, and many other diseases.

Hr. Min. Sec.
Ending time: _____
Beginning time: _____

No. words 505 $\times 60 =$ _____ WPM
No. seconds _____

ACTIVITY 1—PROBLEMS, SOLUTIONS, RESULTS

- 1. a. State Problem 1: _____
b. What was done about it? _____
c. What was the result? _____
- 2. a. State Problem 2: _____
b. What was done about it? _____
c. What was the result? _____
- 3. a. State Problem 3: _____
b. What was done about it? _____
c. What were the two results?
(1) _____
(2) _____

ACTIVITY 2—GROWING A PENICILLIUM MOLD

Read the directions and explanations below *very* carefully. If you overlook, mispronounce, or misunderstand even one word, your experiment is apt to be a failure. Be sure to notice which sentences are *directions* and which ones are *explanations*. Underline the directions with one line. Underline the explanations with two lines.

Place a cut orange on a dish in a warm place. Let it stand in the open air for a while. Spores of molds are floating in the air everywhere. Some of these will alight on your orange. Next cover the orange with a glass jar. The spores will feed on the orange and begin to grow. Soon you will see a blue-green mold on the orange. This is penicillium mold. After the mold has developed, touch the top of one of the colonies of the mold with your finger. When you touch the mold, hundreds of tiny spores will stick to your finger or fly in the air.

Write the directions in a few words.

- 1. _____
- 2. _____
- 3. _____
- 4. _____

Answer these questions in regard to the explanations:

- 1. Why must the orange be left in the open air for a while? _____
- 2. What does the mold feed on? _____
- 3. What will you see on the orange after a time? _____
- 4. What is this called? _____
- 5. What happens when you touch a mold with your finger? _____

Comprehension score: _____ WPM: _____



The Gold Rush in the Yukon

On this page and the next page you will find some problems about the Yukon.

You have already learned that you should read *mathematics* differently than you read *literature*, *social studies*, or *science*. In the discussion of reading skills in *mathematics* on page 8, five procedures were stated which should be helpful to you in reading problems before you compute them.

The first thing to do in reading a problem is to read the entire problem carefully enough to get an over-all understanding of the problem as a whole. You had practice in doing that on page 9.

PROBLEMS ABOUT THE YUKON

1. When new gold fields were discovered in the Yukon between 1896-1899, a gold rush attracted many people. The population in one area increased from 500 white men to 40,000 in this three-year period.
 - A. How much did the population increase?
 - B. This increase is what per cent of the 1896 population?
 - C. What was the average increase per year?

Problem A

What does Problem A ask you to find? 1896 -

1899 population increase in one area

What number facts are given you to use in finding what the problem asks you to do? 500 at

beginning and 40,000 at end of 3 years

Problem B

What does Problem B ask you to find? _____

NUMBERS AND THE YUKON

The second step is to reread the sentence or sentences which ask you or tell you what to do. You also had practice in doing this.

You will now have practice in doing steps 1 and 2, plus the third step with the more difficult type of problems at your level.

The third step is to answer the question, "What number facts are given me with which to work?"

1. Read each of the problems below as carefully as necessary to grasp an understanding of the problem as a whole.

2. Reread the sentence that asks you to find something, and write your answer to the question: "What are you asked to find?" Don't just copy the question from the problem. Tell what you are to find in your own words.

3. Reread the sentences that contain numbers, and write your answer to the question, "What facts are given?"

Some of these problems have several parts to them. In such cases you will need to answer the same two questions about each part of the problem.

Questions about the first part of the first problem are answered for you.

What number facts are you given to work with in finding this?

Problem C

What does Problem C ask you to find? _____

What number facts are you given to work with?

2. Of the 5000 men who tried to cross White Pass in the autumn of 1897, only 500 reached the shores of Lake Bennett.
 - A. What percentage of the men did not get through White Pass?
 - B. What percentage of the total number of men who reached Dawson (40,000) are these 500 prospectors?

Problem A

What are you asked to find? _____

What facts are you given with which to work?

Problem B

What are you asked to find? _____

What facts are you given with which to work? _____

3. The N.W.M.P. required each prospector to bring into the Yukon a year's supplies, amounting to a ton.
- A. If a prospector carried 100 lbs. at one time how far would he have to walk to move his ton of goods 6 miles?
- B. What per cent of this distance would the 6 miles be?

Problem A

What does Problem A ask you to find? _____

What number facts are given you with which to work? _____

Problem B

What does Problem B ask you to find? _____

What number facts are given you with which to work? _____

4. Estimates state that of the 100,000 men who left for the Yukon only 40,000 arrived. Of these, 4000 found gold.
- A. What per cent of the gold seekers never saw the Yukon?
- B. What per cent of the prospectors in the Yukon did not find gold?
- C. What per cent of the people who started for the Yukon became successful gold prospectors?

Problem A

What does Problem A ask you to find? _____

What number facts are given you with which to work? _____

Problem B

What does this problem ask you to find? _____

What facts are given with which to work? _____

Problem C

What does Problem C ask you to find? _____

What facts are given you with which to work? _____

5. One prospector bought a claim for \$800.00. In four years he took \$1,200,000 worth of gold from it.
- A. What was his yearly profit from his investment?
- B. What fraction of the total profit did the claim cost him?
- C. How many times did he double his investment?

Problem A

What does the problem ask you to find? _____

What facts are you given with which to work? _____

Problem B

What does this problem ask you to find? _____

What facts are given with which to work? _____

Problem C

What does the problem ask you to find? _____

What facts are you given with which to work? _____

REVIEWING SILENT LETTERS

You will recall from your work in other grades that in certain words there are letters which have no sound when we pronounce the words. These letters are called *silent letters*. Consonants are sometimes silent, and vowels are sometimes silent.

Each of the words below has one or more silent letters in it. Pronounce each word to yourself. Decide what letter or letters are silent. Cross out the silent consonants in the first exercise, the silent vowels in the second.

Cross Out Silent Consonants

- | | | | |
|----------------------|---------------|------------|---------------|
| 1. ~~w~~ rite | 10. wren | 19. know | 28. patch |
| 2. surround | 11. insight | 20. though | 29. knife |
| 3. knit | 12. high | 21. honor | 30. thumb |
| 4. rack | 13. barrow | 22. knock | 31. tunnel |
| 5. lamb | 14. latch | 23. knot | 32. calf |
| 6. knee | 15. pneumonia | 24. crumb | 33. ditch |
| 7. island | 16. sword | 25. lick | 34. flight |
| 8. wrinkle | 17. castle | 26. hatch | 35. discuss |
| 9. yolk | 18. sign | 27. office | 36. propeller |

Cross Out Silent Vowels

- | | | | |
|------------------|--------------|---------------|---------------|
| 1. lo <u>a</u> n | 11. steam | 21. complain | 31. chief |
| 2. treat | 12. explain | 22. repeat | 32. recognize |
| 3. compute | 13. deal | 23. beat | 33. eager |
| 4. people | 14. reveal | 24. practice | 34. range |
| 5. freedom | 15. climate | 25. pale | 35. meal |
| 6. thread | 16. glance | 26. increase | 36. grove |
| 7. statement | 17. shoulder | 27. coast | 37. airplane |
| 8. goal | 18. praise | 28. available | 38. beach |
| 9. creature | 19. detail | 29. contain | 39. reason |
| 10. remain | 20. include | 30. message | 40. speech |

REVIEWING TWO-LETTER BLENDS

When two consonants are blended together to make just one sound, this sound is called a *blend*. The most common two-letter blends are:

bl, cl, fl, gl, pl, sl br, cr, dr, fr, gr, pr, tr
sc, sk, sm, sn, sp, st, sw, tw

Check yourself to see how well you know these blends. Pronounce the word which each of the pictures represents. Think of the blend beginning the word. Write the blend to complete the word at the right of the picture.

1.  _____am	11.  _____ay
2.  _____eeple	12.  _____irt
3.  _____anket	13.  _____oke
4.  _____isoner	14.  _____ine
5.  _____atter	15.  _____agonfly
6.  _____ame	16.  _____og
7.  _____ush	17.  _____aph
8.  _____ab	18.  _____out
9.  _____ove	19.  _____an
10.  _____eeve	20.  _____onge
21.  _____ail	

REVIEWING SPEECH SOUNDS AND THREE-LETTER BLENDS

Three-Letter Blends

The three-letter blends often cause trouble. Words beginning with these blends are more difficult for students to pronounce than words that begin with one consonant or a two-letter blend. These are the

most common three-letter blends: spr, str, shr, spl, scr, thr.

Write the three-letter combination to complete the word at the right of each picture.

1.  _____ead	2.  _____inter	3.  _____imp
4.  _____ap	5.  _____ew	6.  _____ush

Speech Sounds

In the blends you can hear a little of each of the letters. The speech sounds are different. In the speech sounds you usually do not hear either of the two letters. The two letters usually combine to make a new sound entirely.

The most common speech sounds are sh, wh, ch, th, qu, ck, ng, and nk. The speech sounds wh and qu

never come at the end of a word; however, ck, ng, and nk always come at the end of a word. Sh, ch, and th may come either at the beginning or the end of a word.

See how well you know the speech sounds. Write a speech sound to complete the word for each of the pictures below.

1.  _____ip	2.  _____istle	3.  _____ill
4.  mi_____	5.  _____eese	6.  _____istle
7.  ri_____	8.  _____easant	9.  tee_____

Using Blends and Speech Sounds

You will find some words below which are in Unit Three in this book. Draw a line under each blend or speech sound in each word. Some words have more than one of these combinations in them. As you underline a blend or speech sound, think about the sound of the part or parts you underlined. If there

are some words which you don't know how to pronounce at first glance, you will find that thinking about the sound of the blend or speech sound will give you a very good start in working out the pronunciation of the word. Remember this when you meet difficult words in your other books.

- pleasant
- classes
- health

- scoop
- glance
- Chinese

- group
- skin
- blood

- program
- sport
- school

REVIEWING VOWEL SOUNDS

You reviewed the long and short sounds of the vowels on pages 11 and 14. There are other sounds of vowels which you need to have freshly in mind if you are to pronounce new words successfully in the books that you use this year.

When the letter r follows a vowel, it changes the sound of the vowel. The letter r changes the sound of a in two different ways. Sometimes r makes a sound as it does in arm; at other times it makes a sound as it does in câre. The sound of a as in câre occurs in all one-syllable words in which there are two vowels as: share, bear, air.

The letter r changes the other vowels, also:

ê as in maker; ê as in hear, fear; ô as in orb; û as in urn.

The vowel e has still a different sound when fol-

lowed by r as in her; and the vowel i usually has a different sound when followed by r as in bird. Both of these sounds, however, are the same as the sound of û when followed by r. So Webster's dictionary doesn't give any special mark to show this sound of e or i. The pronunciation of her is shown in the dictionary like this: hûr. The pronunciation of bird is shown like this: bûrd.

Below are some tables for the different vowels. A sample word is given for the sound of each vowel followed by r in cases in which Webster gives a special marking for such a vowel.

Mark all of the a's, o's, and u's in the words below the following table. Some of these vowels have the long sound, some have the short sound, and some have a sound that is changed because it is followed by r.

<u>ā</u>	ale	<u>ä</u>	arm	<u>ô</u>	orb	<u>û</u>	cube
<u>ă</u>	add	<u>ō</u>	old	<u>oo</u>	food	<u>ũ</u>	up
<u>â</u>	care	<u>ö</u>	odd	<u>oo</u>	foot	<u>û</u>	urn

- | | | | |
|----------|----------|------------|-------------|
| 1. plant | 5. art | 9. close | 13. student |
| 2. act | 6. rose | 10. school | 14. study |
| 3. late | 7. job | 11. pupil | 15. good |
| 4. hard | 8. short | 12. turn | 16. share |

Mark the vowels in the words beneath the table. When you come to a word in which the vowel e or i has the sound of û followed by r respell the word with u and mark the u. Cross out silent vowels.

<u>ē</u>	eve	<u>ē</u>	maker	<u>e</u>	her (hûr)	<u>ī</u>	ill
<u>ĕ</u>	end	<u>ĕ</u>	here	<u>i</u>	ice	<u>i</u>	bird (bûrd)

- | | | | |
|------------|----------|-----------|------------|
| 1. people | 5. meet | 9. whip | 13. smile |
| 2. person | 6. deer | 10. first | 14. prize |
| 3. contest | 7. serve | 11. mile | 15. skit |
| 4. Alberta | 8. else | 12. shirt | 16. farmer |

Now mark the vowels in this mixed list of words. Cross out the silent vowels.

- | | | | |
|----------|-----------|------------|-----------|
| 1. bare | 8. bar | 15. book | 22. thorn |
| 2. part | 9. made | 16. stone | 23. fear |
| 3. stage | 10. hare | 17. those | 24. pot |
| 4. arc | 11. flat | 18. home | 25. mule |
| 5. rare | 12. Clark | 19. for | 26. burn |
| 6. farm | 13. shoot | 20. good | 27. luck |
| 7. flash | 14. horn | 21. hunter | 28. fume |

RECOGNIZING WORD PARTS AND THEIR MEANINGS

One of the best ways to improve your reading and your grades is to improve your methods of pronouncing new words and getting their meanings. The dictionary is, of course, the most authoritative source for looking up word meanings. There are several methods, however, which you can use directly while working with the pages in a textbook.

1. Be sure to use the vocabulary aids that most of your textbooks give you. If your books give you lists of new words at the beginnings of chapters or at the bottoms of pages, read quickly through these *before* you start reading your assignment. Give special attention to key terms italicized and defined in the body of the text. Study tables and diagrams with a view to identifying and distinguishing among any new

terms. Take advantage of the glossary, if there is one. You can use the index to find the location of many definitions.

2. Take the time to pronounce a word that you don't recognize. Once you break it into syllables, you'll often find that you know the word after all.

3. Use the context. The rest of the sentence or paragraph often gives the definition.

4. Study the meanings of the word parts. You already know the meanings of most of the roots, prefixes, and suffixes that are used to form long words. You can use this knowledge to get the meaning of a word. You will be given practice in breaking words into parts on this page. All of the words with which you will work are in the next unit in this book.

Finding Parts in Compound Words

Draw a line between the words in each of the compound words below. Then write the meaning of the word.

1. basketball _____
2. newspaper _____

Finding Root Words

Many of the words which you will read in your grade are made up of a basic or root word together with one or more syllables which have been added

- | | | | |
|--------------------|------------------|-------------------|----------------|
| 1. <u>addition</u> | 5. consideration | 9. classification | 13. especially |
| 2. activities | 6. successful | 10. revisited | 14. excellent |
| 3. formation | 7. generally | 11. unthinking | 15. personal |
| 4. harmful | 8. comforting | 12. greatest | 16. useful |

at the beginning or end of the word. Underline the root word in each of the words below. The first one is done for you.

Working with Prefixes

A word element placed before a root word to change its meaning is called a prefix.

The prefix re means "again." The prefix dis means "not" or "apart."

Write one of these prefixes before each of the words below, and then give the meaning of the new word you have made.

1. _____ read _____
2. _____ move _____
3. _____ approve _____
4. _____ allow _____

Working with Suffixes

A word element placed at the end of a word to change its meaning is called a suffix.

The suffix ion means "act or state of"; thus *production* means "act of producing or making."

The suffix ship means "ability" or "skill"; thus

horsemanship means "ability or skill in dealing with horses."

Write one of the suffixes after each of the words below, and give the meaning of the new word you have made.

1. digest _____
2. discuss _____
3. sportsman _____
4. citizen _____

WORKING WITH MATHEMATICS WORDS AND PHRASES

The words and phrases below appear in widely used *mathematics* textbooks at your level. No doubt they are in the *mathematics* books which you are using.

Work out the pronunciation of each of the words or phrases. Pronounce the word or phrase distinctly to yourself. Then study the meaning which each word has in mathematics.

abacus ăb'ă kŭs	An instrument used for counting in ancient times.
broker brō'kēr	One who brings together buyers and sellers and receives a sum for the sales contract resulting from his efforts.
calculating machine kăl'kŭ lăt'ing	A machine which performs computations.
centimeter sĕn'tĭ mĕ'tĕr	A measure in length used in Europe, equal to one hundredth of a meter. 2.54 centimeters equal one inch.
commission kŏ mĭsh'ŭn	A percentage of the total amount of a sale which is paid to a broker for his services.
dimensions dĭ mĕn'shŭnz	Measurements, usually in length and breadth or in length, breadth, and thickness.
disk disk	A round, flat plate or surface.
endorse ĕn dôrs'	To sign one's name, as payee on the back of a note or bill.
installment plan ĭn stŏl'mĕnt	A method of buying goods with regular payments over a period of time.
investment ĭn vĕst'mĕnt	The placing of money or capital in order to get income or profit.
invoice ĭn'vois	A written statement of goods shipped to a purchaser.
kilogram kĭl'ŏ grăm	A standard unit of weight in the metric system equal to a little more than two pounds.
knot nŏt	The speed of one nautical mile per hour.
mathematics măth'ĕ măt'ĭks	A group of sciences dealing with quantities, magnitudes, and operations. <i>Arithmetic</i> , <i>algebra</i> , and <i>geometry</i> all belong to the mathematical sciences.
operating expense ŏp'ĕrăt'ing ĕks pĕns'	The money a man pays out to run his business, such as rent and wages.

See if you know the meaning of each of these words as it is used in mathematics. Choose one word to write in each blank space. Add *s* if necessary.

- The bank clerk asked Mr. Wood to _____ the back of the check he presented.
- Mr. Robinson had some extra money to use for earning profits. He made several _____ in stocks.
- A phonograph record is shaped like a _____.
- Mr. Kemp didn't make any profit from his business. He spent all the money that he took in for _____ expenses.
- A European shopkeeper measured the length of the floor in his store. He found that it was 5 meters and 1 _____ long.
- When Mr. Johnson bought his home, he paid the _____ \$500.00. This was the latter's _____ for finding the place for Mr. Johnson and making arrangements for him to buy it.
- The Captain said the boat travelled at a speed of one _____ per hour.
- There were no adding machines in ancient times. People used an _____ for computing.
- Mr. Jones paid \$100.00 per month on his car. He bought it on the _____.
- Bert likes arithmetic and algebra. In fact he likes all kinds of _____.
- The French people use the metric system. One of their standard weight units is the _____.
- Mr. Hopper prepared an _____ of the goods to be shipped to Mr. White.
- John measured the length and breadth of the room to find its _____.
- One canning company handles all of its figures with the use of a _____ machine.

UNIT THREE

GOOD SPORTSMANSHIP



Do you go to basketball games when your school's team plays another team? Do you get very excited toward the end of the game when the scores are close? If you were a player who had a chance to win the game for your school during the last half-minute, how would you feel? Do you think you could keep calm, think clearly, and do the right thing at such a time?

Ted Shannon found himself in just such a situation. The story will tell you what he did about it.

First place in a contest is called a *championship* (chām'pī ūn shīp').

When people think well of you they give you their *approval* (ā prōv'āl).

A person who decides questions that come up during a game is called the *referee* (rēf'ēr ē').

When a person delays or pauses before doing something, he is said to *hesitate* (hěz'ī tāt).

When one draws up his shoulders to show indifference, he is said to *shrug* (shrüg) his shoulders.

Anything that is hard to do is said to be *difficult* (dif'ī kŭlt).

Beginning time: Hr. _____ Min. _____

WIN THE GAME *

Within the crowded gymnasium, Kenmore and Reedville Junior High Schools were playing a hard-fought game for the city basketball championship. Ted Shannon, left forward for Kenmore, caught a high forward pass. He started to pass to Billy Stern, but Billy was unable to break loose from his guard.

The Kenmore rooters shouted, "Shoot, Ted! Take a chance!"

It was a difficult shot, from almost the middle of the court. But Ted took a chance. The ball rose in a high arc, struck against the backboard, hit the rim, hesitated, and then dropped through the hoop.

Above the wild cheering from the Kenmore rooters, the referee's whistle sounded. He called, "Time out for Reedville!"

The Kenmore team was still in the game, but there was less than a minute to play. Reedville was leading, 33 to 32. Was it too late? Could they win?

Two things Ted wanted more than anything else. First he wanted Kenmore to win the city champion-

ship. Second he wanted to win for himself the silver cup that the owner of the *Times-Citizen* newspaper was offering to the junior high school player that scored the most points during that season.

Ted had done all that he could to get himself ready for the game. He had practiced hard. He had been very careful about his diet. He had tried especially to eat foods rich in vitamins to keep himself healthy, alert, and growing.

Art Clark, manager of the Kenmore team, said, "Ted, you and Billy are neck-and-neck. That's the way you'll finish, unless one of you scores in the last minute of play."

As Billy came over, Art said, "I was just telling Ted that you two fellows are tied for high scoring."

"Right now I don't care about that high scoring—or the cup, either," Billy answered. "What I want is to *win this game!*"

Again the whistle sounded. The game was on. Reedville took the ball, working it down the court, while their rooters roared approval. Almost under the Kenmore basket, the Reedville center grabbed a pass from one of their forwards. Then he dodged away from the Kenmore guard. He was all ready to

* Carter, Russell Gordon, *Story Parade*, Nov., 1949, pp. 12-14. Copyright, 1949, by Story Parade, Inc. Reprinted and adapted by permission.

shoot, when Ted hurled himself at him, and the ball dropped free.

When it was scooped by another Kenmore player, their rooters yelled, "Come on Kenmore! We want another basket!"

There was only half a minute left, as Ted leaped high and took a quick pass from Billy. Then he threw the ball to Lew and raced to the right.

Lew tried but failed. The Kenmore crowd groaned.

Billy caught the ball, but, as he was about to shoot, one of the Reedville guards blocked him. He ducked and whipped the ball outward in a hard, underhand pass.

"Ted," Billy yelled. "Shoot!"

The ball hit Ted's outstretched hands. He was all alone on the right-hand side of the court, well out from the basket. It would be another difficult shot. Could he do it again?

While the Reedville center charged at him, Ted took careful aim. This was his big moment. A basket now would not only win the game, but give him the silver cup!

Suddenly everything changed. Out of the corner of his eye, he saw Billy almost under the basket and no one was near him! Billy's words flashed through

Ted's mind. "Right now I don't care about that high scoring—or the cup, either. What I want is to *win this game!*"

Win the game, Ted thought. That was the important thing. Never mind high scoring for himself. Win the game! Take no chances on a difficult shot. . . .

The Reedville guard and center were almost upon him when he passed the ball to Billy. Billy aimed. The ball fell through the hoop!

The whistle blew. The game was over. Kenmore had won the championship!

In the locker-room, Captain Goldman came to the bench where Ted and Billy were dressing. "That was a big thing you did, Ted," he said. "That's what I call being a good sport."

Ted shrugged. "Billy would have done the same thing in my place, wouldn't you, Billy?"

"I'm not sure," Billy admitted. "I hope I would have been that good a sport. That was tough for you, Ted, missing out like that on high scoring honors. It's almost as if you handed the thing to me."

Ted grinned. "Right now I don't care so much about that—or the cup, either. All I wanted was to *win the game!*"

Hr. Min. Sec.

Ending time: _____

Beginning time: _____

No. words $\frac{754}{60} \times 60 =$ _____ WPM

No. seconds

COMPREHENSION QUESTIONS

1. Can you draw a line from each of the characters below to the name of the story in which you read about him?

Chip Art Billy Peter Lew Ted

"Win the Game" "Chip Brown, Jumper"
"Lobo, The Malemute"

2. What was the name of the school on whose team Ted

Shannon was playing? _____

3. Who was offering a prize for the player who scored the

most points? _____

4. What had Ted done to get himself in shape for the

game? _____

5. Who was "neck and neck" with Ted when it came to

points for winning the silver cup? _____

6. What happened when Lew threw the ball to the

basket? _____

7. To whom did Billy throw the ball in an underhand

pass? _____

8. Why was it a big moment for Ted when he took aim with the ball the second time? _____

9. Who threw the last ball through the loop for Kenmore? _____

10. What reason did Ted give for passing the ball to Billy to throw in the basket? _____

Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

Write your answers on separate paper.

1. Why was this a particularly important game?
2. Do you think Ted deserved the wild cheering from the Kenmore rooters the first time he threw the ball through the hoop? Why?
3. How do you think the game might have ended if the Reedville guards hadn't blocked Billy when he was about to shoot?
4. Would you have done what Ted did? Why?
5. What qualities made Ted a good sport?

WHAT IS A GOOD SPORT?



When Captain Goldman was talking to Ted after the game he said, "That's what I call being a good sport." What did he mean? Just what is a good sport? These questions are answered in the selection below.

This selection is similar to some of the material that you find in your *citizenship* books. It gives rules for being a good sport.

1. Glance through the boldface headings to find out what the rules for good sportsmanship are.
2. Read the selection carefully to find out what you have to do about each rule in order to be a good

When we think well of what a person does, we *approve* (ǎ prōōv') of him.

Thoughtfulness of others is *consideration* (kǒn sīd' ēr ā'shūn).

When we wish joy to another because of some good that has come to him, we are said to *congratulate* (kǒn grāt'ū lāt) him.

sport. As you read this information about each rule, try to recall examples from your own experience in which someone has or has not applied the rule. Think, also, of examples in which you, yourself, have or have not applied the rule.

Time yourself as you read this selection. This is fairly easy material. You should read it fast.

If we do not think well of a person, we *disapprove* (dis'ǎ prōōv') of him.

When conditions are suitable for a person to carry out his purpose, he is said to have an *opportunity* (ōp'ōr tū'nī tī).

When we put an idea into another person's mind, we are said to make a *suggestion* (sūg jēs'chūn).

Beginning time: Hr. _____ Min. _____

RULES FOR GOOD SPORTSMANSHIP

We often think of sportsmanship as having something to do with games and sports. Sportsmanship shows up very plainly in games such as basketball, baseball, and football. People are quick to notice good sportsmanship also in ski racing, boxing, running and jumping events, and all other forms of sport contests.

If a person is a good sport, his team or those competing with him notice it at once. Those who are watching the game or event notice it, too. Even if he loses the game, he is approved if he is a good sport. Even if he wins the game, he is disapproved if he is a poor sport.

All of this is just as true in everything we do in life as it is in games or sports. Our friends, our family, those with whom we work approve of us if we are good sports, and disapprove of us if we are poor sports.

Some rules are given below for being a good sport. If you do all of these things, then you are, no doubt, a good sport.

Show consideration for others. Helen took turns with her older sister and her mother in washing the dinner dishes. But she always left the pots and pans

for her sister or mother to do. "I don't like to wash pots and pans," she'd say. Probably her sister and her mother didn't like to wash pots and pans either. Helen was a poor sport. She was thinking only of herself and not showing consideration to others.

When you have an unpleasant job to do, remember it is unpleasant for others, too. Don't pity yourself or try to get someone else to do it for you. Go ahead with your hard, dull tasks. Help others when they are doing an unpleasant task. Also follow the golden rule of doing for others as you would have them do for you, and then you can be sure that you are showing consideration.

Follow the rules of the game. In playing a game there are certain rules which all must follow in order that the game may be played fairly. If one doesn't follow these rules, one is not allowed to play.

There are rules for doing many things in life beside playing games. There are rules for doing your school work, for crossing the street, for fire drills, for driving a car, for picking wild flowers in certain places, for putting out camp fires, and many other things. These rules are made not only for your own good but also

for the good of others. It is just as important that you follow these rules in life activities as it is for the football player to follow the rules of the football game. A good sport follows all of the rules wherever he finds them.

Work with the team. Ted gave up an opportunity to win the silver cup for himself because he didn't want to take the chance of having his team lose the game. He was more interested in the happiness of all who attended Kenmore school than in his personal happiness in winning the cup. He worked always for the greatest good of his team.

Even though you are not playing a game, you are nearly always working or playing with a team. Your class in school is a team; a committee which is asked to do a certain thing in the classroom is a team. The group of friends with whom you spend much time outside of school is a team. Your family is a team.

It is just as important that you help each of these teams to do whatever it sets out to do as it was for Ted to do what he did to help his basketball team win the game. Each group has a certain goal or goals in mind. It is your job to help the "team" in every way you can to reach its goals.

The only exception is when the team has an unworthy goal. "Come on. Let's go back and cover

old lady Gray's window with soap. She didn't give us a good enough treat," said Tom to the five friends with whom he was having Halloween fun. The group started off. "I'm not going," said Fred. "Be a sport. Come on," cried Jim. "I don't think making a lot of work and expense for an old lady is being a sport," replied Fred. The whole group turned their attention to something else at this point.

When the group wants to do something that isn't right, then the really good sport is the one who can stand on his own. In such a case the good sport does not go along with the group because they dare him, call him "chicken," or tell him that he should be a good sport and join them.

Be a good loser. One of the most important rules of good sportsmanship is to take disappointment, defeat, or bad luck with a smile. Then start trying harder than ever to do what it is that you want to do successfully next time.

A good loser never complains, makes excuses, sulks, or hits back with words when he fails at something. Doing any of these things can bring no good to anyone. They may be harmful to the loser in the future. The thing to do is to clear your mind of the old disappointment and give all of your thought and energy to new goals ahead.

Hr. Min. Sec.

Ending time: _____
Beginning time: _____

No. words $\frac{926}{\text{No. seconds}} \times 60 = \text{_____ WPM}$

ACTIVITY 1—APPLYING THE RULES OF GOOD SPORTSMANSHIP

Each story below represents a rule about good sportsmanship. Read each one and answer the questions.

A. Two men ran for Parliament in an election. One won the seat. The other was defeated. The one who was defeated sent a warm message to the one who was elected. He congratulated the winner. He also said that he, as a Canadian, would live up to the rules and programs of the government.

1. Which rule? _____
2. Was it applied? _____
3. Was the defeated man a good sport? _____

B. Signs were fastened to the fence around the playground saying, "Do not throw paper or bits of food on the playground." Howard was to meet Robert on the playground one Saturday afternoon to practice catch. Howard got there first and had to wait. While waiting he pulled a candy bar from his pocket. After eating the bar, he didn't know what to do with the paper in which the candy bar

was wrapped. "Oh, I'll just throw it down and get rid of it," he said. "No one, not even Robert, will know."

1. Which rule? _____
2. Was it applied? _____
3. Was Howard a good sport? _____

C. Paul's school was giving a program. Students who could sing or play were to furnish the music. Those who could act were to put on skits.

Paul could do none of these things. He wasn't invited to appear on the stage at all. Still he wanted his school's program to be a big success. He asked if he might help to welcome the guests at the door, and show them to their seats. He was told that he might do this. Paul made all of the guests feel comfortable and glad that they had come.

1. Which rule? _____
2. Was it applied? _____
3. Was Paul a good sport? _____

D. Write a personal example on separate paper.

Comprehension score: _____ WPM: _____

HOW FOODS HELP TO WIN THE GAME



In the story about Ted, you read that Ted had done all that he could to get himself ready for the game. He ate the different kinds of food his body needed. He tried especially to eat foods rich in vitamins.

What did the vitamins have to do with making Ted a better basketball player? The selection below will tell you.

This selection is similar to material which you often find in your *science* books. As you have already been told, you should read such material differently than you read a story or social studies material.

Scientists often use the classification method in their work. They experiment or observe in some general group of things until they can divide a larger group into smaller groups, each of which is different in some ways from the others. This is called the *classification method*.

Vitamin B₁ is usually called *thiamin* (thī'ā mīn).

Vitamin B₂ is called *riboflavin* (rī'bō flā'vīn).

Another common name for Vitamin B₆ is *niacin* (nī'ā sīn).

A fat which is used in place of butter is called *oleomargarine* (ō'lē ô mār'jā rēn).

The selection below is a classification article. In this selection, the boldface headings tell you what the general classifications are. The italic headings name the smaller classifications under a general heading.

1. Glance through the entire selection to find the names of the different groups of vitamins, both the major groups and the subgroups.

2. Read the article carefully to find out: (a) the uses of each group of vitamins and (b) where these vitamins are found.

Vitamin C is called *ascorbic* (ā skôr'bik) *acid*.

A disease caused by lack of vitamins is called *beriberi* (bēr'ī bē'rī).

A disease due to faulty diet is called *pellagra* (pě lā'grā).

VITAMINS

Several years ago, scientists discovered different classes of food and their uses in the body. You will remember that these food classes are proteins, carbohydrates, fats, and minerals. All of these are needed in the right amounts. Some other things are needed also to help us grow and to keep us healthy. These other things are not foods. They are *in* foods. They are the vitamins.

Vitamins are certain chemicals found in foods. Several of them have been discovered, and different uses have been found for them. As each one was discovered, it was labeled with a letter of the alphabet. We have Vitamins A, B₁, B₂, B₆, B₁₂, C, D, and K. Some of these vitamins now are generally known by their chemical names rather than by their letters. Vitamin B₁ is thiamin, B₂ is riboflavin, B₆ is niacin, and C is ascorbic acid.

VITAMIN A

Vitamin A helps us to grow. It is needed for the health of the eyes, and it helps to prevent colds.

Milk, butter, and cheese will give you a goodly amount of Vitamin A. Enriched oleomargarine also

contains Vitamin A. This vitamin is found in green and yellow vegetables and fruits, also. The yellow vegetables and fruits are especially rich in Vitamin A. Fish liver oils, egg yolks, and the "organ" meats (kidney, liver, and heart) all contain Vitamin A.

THE B VITAMINS

Vitamin B₁, or thiamin. This was one of the first vitamins found. Chinese and Japanese soldiers often suffered with a disease called *beriberi*. They lived almost entirely on polished rice. A doctor found when the men were fed whole-grain rice with meat and vegetables, they didn't have beriberi. The search began for the chemical that kept these men from having beriberi, and Vitamin B₁ was found.

It was later learned that B₁ has other uses. It gives one a good appetite and helps digestion. It also aids the body in using carbohydrates.

Vitamin B₂, or riboflavin. Vitamin B₂ helps us to grow. It keeps the skin and muscles healthy. Most important of all, it aids the body to change foods into energy. Meats, dairy products, and green vegetables contain Vitamin B₂.

Vitamin B₆, or niacin. This vitamin was discovered when doctors were trying to find a way to prevent a disease called *pellagra*. One doctor found that people who ate fresh meat and drank milk did not have this disease. Experiments followed and B₆ was discovered.

The most important use of this vitamin is to prevent *pellagra*. It is known also to aid growth and to help the stomach and intestines to work properly.

Vitamin B₁₂. This is the latest of the B vitamins to be discovered. This vitamin aids growth because it gives us a good appetite. It also helps to build red blood cells.

B₁₂ is found in milk, butter, meat, vegetables, and fruit.

VITAMIN C

This vitamin, known as *ascorbic acid*, is needed for good teeth and healthy gums. It also prevents *scurvy*.

Vitamin C is found in oranges, grapefruits, lemons, limes, tomatoes, fresh strawberries, and cabbage.

VITAMIN D

Vitamin D is one of the most important vitamins. This vitamin helps to build strong bones and teeth. It also prevents rickets.

We get this vitamin from sunshine. Other sources are fish oils, egg yolks, and irradiated milk. This is milk which has been bathed in certain rays. It is labeled "Vitamin D" milk.

VITAMIN K

One more vitamin which you should know about is Vitamin K. This vitamin helps to clot the blood and thus is an aid in stopping the flow of blood in case of cuts or wounds. It is found in leafy green vegetables, egg yolks, and milk.

ACTIVITY 1—CLASSIFYING VITAMINS

Fill out the table below. Write the name of each vitamin, give one or two important uses, and name one or two sources.

Name	Uses	Where Found

Applying What You Have Learned About Reading in Your Science Books

Sometimes an entire chapter in a *science* textbook deals with classifications. At other times only a part of a chapter is given over to discussion of classifications. In any case, look for this kind of material. Whenever you find it, the best way to get the information is to read it in the same way that you read the selection on vitamins.

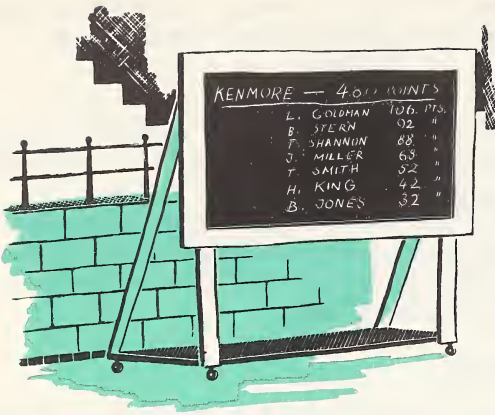
1. Glance through the entire chapter or section to find out what the different classifications are. The names of the classifications may be in boldface or

italics or both. In case there are no headings, you will have to read into the paragraphs until you find the names of the different groups.

2. Read to find out in what way each classification is different and in what way it is like the others.

It will be helpful if you make a table of the different classifications and the information that is given about each one similar to the table you made about vitamins.

POINTS AND POUNDS



On this page and the next one you will find some problems about "Points and Pounds." You have already learned that you should read arithmetic problems differently than you read literature, social studies, or science.

You have learned to apply three steps that are helpful in reading problems at your level. These three steps are very important in getting ready to compute a problem. But you need to make sure of one more thing—what *process* you must use. After you know what you are to find and what number facts are given you to work with, you must decide whether to add, subtract, multiply, or divide. You may have to read the problem all through again to gather the information you need in making this decision.

In working with the problems below:

1. Read each problem to understand it as a whole.

2. Reread the problem to make sure what you are to find. Write this information in your own words under the heading *To Find*.

3. Reread the problem to select the facts which are given to you to use in solving the problem. Write these facts under the heading *Given*.

4. Reread the problem to decide what process to use. Make the sign for this process under the heading *Process*. For example, if you decide to add, you will place the sign $+$ under the heading; if you decide to divide, you will place the sign $\div$ under the heading, and so on.

In computing some of the problems, you will need to use two steps. In such cases place two signs under the heading. For example if you decide that you will need to multiply first, then divide, you would write these signs under the heading of *Processes*: $\times \div$

PROBLEMS ON BASKETBALL AND FOOD*

1. During one season the Kenmore team scored a total of 480 points, with Ted Shannon scoring 88 of them. What per cent of the total scoring was done by Ted?

To Find
Per cent of total
points Ted scored

Facts
Total, 480;
Ted's score, 88

Process
 $\div$

2. Last year the number of Ted's points for the season was about 74 per cent of his total this year, when he made 88. How many points did Ted score last year? Note that he couldn't score a fraction of a point.

To Find

Facts

Process

3. Billy Stern scored 92 points this year. What percentage of the total of 480 points did Billy make?

To Find

Facts

Process

4. Jack Miller made 68 points. What per cent of the total number of 480 points did Jack make?

To Find

Facts

Process

* Based upon material prepared by Francis J Mueller.

5. Tom Smith made 52 points, Harold King made 42 points, and Bob Jones made 32 points. How many points did all three of these boys together contribute toward the total for Kenmore School?

To Find

Facts

Process

6. This year Captain Lew Goldman scored 106 points and last year he scored about 25 per cent less than that. How many points did he score last year?

To Find

Facts

Processes

7. Jane was planning to report the results of her survey on acts of good sportsmanship to the class. She observed children on the playground for 2 months during recess periods. During this time she observed 190 acts but only about 65 per cent of this number were acts of good sportsmanship. How many acts of good sportsmanship did Jane observe?

To Find

Facts

Process

8. In Canada the average person eats 142.7 lbs. of meat per year, and 45.2 per cent of it is beef. On the average, how many pounds of beef (to the nearest $\frac{1}{10}$ of a pound) does a person in Canada eat per year?

To Find

Facts

Process

9. In 100 lbs. of butter there are 9.6 ounces of protein. What per cent of butter is protein (1 lb. = 16 oz.).

To Find

Facts

Processes

10. Boys between 13 and 15 years of age need about 3,200 calories per day, while a girl that age needs 12½ per cent less. What is the daily number of calories needed for girls 13 to 15 years old?

To Find

Facts

Processes

If you have time you may compute the problems.

Applying What You Have Learned About Reading Arithmetic Problems

If you have trouble with a problem in your *arithmetic* book, reading it carefully will help you greatly to get a good start in solving it correctly. In reading it carefully, do all of the things that you have been doing in working with the problems above: (1) Read the entire problem to grasp its meaning as a whole; (2) reread the sentence that tells you what to find; (3) pick out the number facts which are given you

to use in finding what you are supposed to find; (4) reread again to decide upon the process to use.

When you come to an especially difficult problem, tackle it by writing the three headings *To Find*, *Facts*, and *Process*. Then proceed to reread parts of the problem and to write information under each of these headings as you did in working with the problems on these two pages.

DIVIDING WORDS INTO SYLLABLES

You are beginning to read material in your grade in which there are many long words—words of three, four, or five syllables. These long words are the ones that students most often have trouble in pronouncing. You have learned the sounds of letters and letter combinations. Now if you learn some quick ways to break a word into syllables, you should be able to pronounce any word, long or short, that you meet.

What is a syllable? You have already learned that a syllable is a word or a part of a word in which

there is a *sounded* vowel. Silent vowels don't count when dividing words into syllables.

You know how to tell when a vowel is silent: when two vowels come together in a word, one of them is usually silent; also, when a single vowel is followed by a final *e*, the final *e* is usually silent. With these two thoughts in mind decide how many *sounded* vowels are in each word below. This will tell you the number of syllables. Finding syllables is the first thing to do in pronouncing long words.

Finding Sounded Vowels

*How Many
Sounded Vowels?*

*How Many
Syllables?*

*How Many
Sounded Vowels?*

*How Many
Syllables?*

1. main	_____	_____	21. Macdonald	_____	_____
2. twins	_____	_____	22. complete	_____	_____
3. branch	_____	_____	23. historical	_____	_____
4. space	_____	_____	24. continental	_____	_____
5. danger	_____	_____	25. children	_____	_____
6. total	_____	_____	26. independence	_____	_____
7. broken	_____	_____	27. Frontenac	_____	_____
8. entire	_____	_____	28. imaginary	_____	_____
9. Sandy	_____	_____	29. tannery	_____	_____
10. detail	_____	_____	30. newspaper	_____	_____
11. prison	_____	_____	31. committee	_____	_____
12. explain	_____	_____	32. sportsmanship	_____	_____
13. corner	_____	_____	33. vitamin	_____	_____
14. ideal	_____	_____	34. carbohydrate	_____	_____
15. convince	_____	_____	35. information	_____	_____
16. important	_____	_____	36. thunderhead	_____	_____
17. control	_____	_____	37. centipede	_____	_____
18. consonant	_____	_____	38. photograph	_____	_____
19. telephone	_____	_____	39. armadillo	_____	_____
20. wisdom	_____	_____	40. instrument	_____	_____

Guide 1: Dividing Between Words Forming Compounds

There are several guides that you can use in deciding where to divide a word into syllables. One of the easiest guides is the one that can be used in working with compound words. You always divide compound words between the words that form the compound word. Sometimes one or perhaps two of

the words forming a compound word are made up of two or more additional syllables. But you are always safe in dividing between the complete words as a starting point.

Divide these compound words into syllables. The first one is done for you.

bakeshop	watchman	halfway	upset
horseback	earthquake	northwest	within
airport	withdrawn	runway	snowshoes
Northland	classmate	seacoast	hailstone

Guide 2: Dividing Between Double Consonants

Another easy guide is one that works with double-consonant words. When a word has double consonants (dd, ss, and so on) within it, you usually break it into syllables by dividing between the double

consonants. Divide the words below into syllables, using Guide 2. Cross off the one of the double consonants which is silent.

message	appeal	carry	correct
getting	current	account	support
differ	saddest	comment	oppose
happen	Anna	suppose	pollen
apply	attack	command	session
suffer	winning	approve	sullen

Guide 3: Dividing Between Separately Sounded Consonants

When two separately sounded consonants come between two sounded vowels in a word, you usually divide between the consonants. The word *person*, for instance, has two separately sounded consonants,

r and s, between two sounded vowels, e and o. So you divide between the r and the s: per/son. Divide the words below, using Guide 3.

center	order	certain	fancy
perhaps	absorb	Neptune	condense
circus	turbine	system	number
compare	fiction	distance	observe

Guide 4: Dividing Before Single Consonants

When a word contains a single consonant between two sounded vowels, you usually divide just before the consonant. The word *vital*, for instance has a single consonant, t, between two sounded vowels, i and a. So you divide just before the t:

vi/tal. There are some exceptions to this guide. But it usually holds.

Divide the words below, using Guide 4. There are no exceptions in this list.

divide	total	decide	chorus
proceed	polar	locate	human
climate	taper	canal	legal
solar	Venus	produce	Pluto
design	season	idol	vapor

FINDING THE MAIN IDEA IN PARAGRAPHS

You have already had some work in using the skill of finding the main idea in a paragraph. To become very expert in using this skill you need to have much practice.

See how quickly you can find and underline the main idea in each of the paragraphs in the selection, "The Beauty of Clouds."

Clouds vary with the seasons. When the white "cotton bales" drift across the blue sky in June, we know that summer is here. The thunderhead cloud comes only on hot, sultry days. November owes its grayness to the heavy blanket of gray clouds overhead. In January the dark shapeless cloud with ragged edges tells us that steady snow is about to fall.

In the paragraph above there is one short sentence which is the "heart" of the entire paragraph. That sentence is "Clouds vary with the seasons." This sentence has been underlined for you. All of the

Remember that you do not always have to underline an entire sentence to show what the main idea is. Sometimes it takes the whole sentence to give the main idea. At other times it is possible to select just a few words or a few phrases from a long sentence which sum up the main idea.

"Read this example:"

other sentences in the paragraph give details telling in what ways clouds vary with the seasons.

Now read this paragraph and note the part that is underlined.

It is very fortunate for those of us who love the clouds, that many clouds, and certainly the most beautiful clouds, occur in fair weather. Following a storm there are clouds which, in the freshened air, are lovelier than those that appeared before the rain.

In the paragraph above, the first sentence contains the main idea, but it doesn't take all of the words in the sentence to give that idea. The "kernel" of the sentence and of the entire paragraph is summed up in the words the most beautiful clouds occur in fair weather. The part of the sentence which gives the

main idea is found in just eight important words.

Read the paragraphs below and underline the main idea in each one. In some paragraphs you will find the main idea in one short sentence. In others you will have to pick out a group of words in a long sentence which gives the gist of the paragraph.

The Beauty of Clouds *

Clouds put interest into the sky—the ever-present background of our world. They make the beauty of the sunset and sunrise. If they often "look like rain," just as often they look like flowering snowballs flung across the heavens. If dark clouds sometimes "dampen our spirits," just as often the northwest wind chases them away, leaving a sky of blue to make us happy.

No doubt people have been interested in the beauty of clouds since earliest times. Poems and stories written by early writers often speak of beauty in the clouds. Some of them describe clouds as being like "fleeces of wool," "sailing white ships," or "layers of pink down."

When you are inside a cloud it looks just like fog. Have you ever ridden through a cloud in an airplane? Or have you ever been in a car when it was driven through a cloud on top of a high mountain? If so, you found that when you are inside of a cloud, the cloud looked just like the fog you walk through on the sidewalk on a foggy morning.

Fogs and clouds are both made of drops of water, but clouds are higher than fog and more dense. The average height of a cloud is about two and a half miles. Thin, light clouds are much higher than the highest mountain. Thick, heavy clouds sometimes touch as low as mountain peaks. Fog, however, always hovers close to the ground.

Artists' paintings show that artists seldom have fully realized the beauty in clouds. To many of them the sky has been a bit of background to be left bare. Others have shown clouds that could mean anything or nothing. No one of the cloud types is definitely shown. In not studying clouds, many artists have truly missed a world of beauty.

On the other hand there has been much interest in photographing clouds with cameras. Beautiful clouds are often fleeting. The camera can catch them at the moment at which they are at their best. Some of the loveliest pictures which have ever been taken are cloud pictures. There are some good books on the market now that tell how to take cloud pictures. Perhaps you would like to get a copy of one of these books and make a hobby of taking pictures of the clouds.

* Parts of this article were adapted from "The Beauty of Clouds," by Gayle Pickwell, *The Mentor*, Vol. 13, No. 6, July 1925, pp. 36-38.

MORE ABOUT FINDING THE MAIN IDEA IN PARAGRAPHS

The first sentence in a paragraph often contains the main idea of the paragraph. This was true of all of the paragraphs with which you worked on page 42. But this is not true of all paragraphs in other reading that you may do. The main idea can be in the last sentence, the middle sentence, or anywhere else in the paragraph. Don't be fooled by always

reading the first sentence in a paragraph and thinking that is the main idea. If you are searching for the main idea, be sure to glance all the way through a paragraph, until you are certain that you have found the one most important thought.

Read this paragraph and notice where the main idea comes.

Would you like to hear about a queer animal? Then we will tell you about the armadillo. The reason the armadillo is queer is that the whole back and sides of its body are covered with hard bony plates. It has very short legs, but it can run fast for a short distance.

In reading the paragraph above, we find that the most important idea is in a sentence which falls in the middle of the paragraph.

Read this paragraph:

What else is odd about the armadillo? He protects himself by rolling up into a ball. When he does this he pulls in his head and legs, so that nothing shows but his hard shell. This ability to roll into a ball is something few other animals have.

In the paragraph above, the gist of the paragraph is summed up in the second sentence.

Read this paragraph:

The armadillo eats insects and worms. He also eats roots and fruit. Unlike many other animals, the armadillo eats vegetables, fruits, and meats.

In this paragraph everything that is said in the paragraph is summed up in a few words found in the last sentence.

Read the selection below. Underline the main idea wherever you find it in each paragraph.

The Mole's Way of Life

Have you ever seen a mole? If you have, you are lucky. There are not many people who have seen this creature. Almost everyone has seen the top of the tunnels which a mole burrows. But not the mole, himself.

The mole is found in the United States and Canada. It is the most important wild fur-bearing animal in the British Isles. It also thrives in Europe, Asia, Australia, and some parts of Africa. The mole in fact is widely distributed in different parts of the world.

A mole digs wherever his fancy leads him. He usually chooses to dig in a place where he will not be disturbed. Hedges, fences, and plant rows are places where people usually do not walk. So these are favorite digging places for this little animal.

If you have ever tried to dig a mole out of the ground you had to work very fast. The swiftness with which moles work is almost unbelievable. One has been known to tunnel more than 75 yards in one night.

The mole's fur has a part to play in his life. Usually it is black with a grayish tinge. It is soft and velvety

and will brush in any direction. No matter which way a mole travels he feels no friction when his coat rubs the walls of the tunnel. Thus his coat protects him in his underground work.

The mole is a great eater. He seems always to be hungry. If he has nothing to eat he dies in from ten to twelve hours.

The mole usually lives with several other moles in an underground home. His home is very complex. There is a central chamber in the middle of his "castle." This is surrounded with two circular tunnels one above the other. There are vertical tunnels which allow the mole to go up and down "stairs" from one of these circular tunnels to the other. From the central chamber there are about nine tunnels which lead out to the feeding grounds.

Once a year, in April or May, the mother mole has a litter of from two to five babies. The young moles grow quickly. In about four weeks they are able to take care of themselves and start digging for food as ravenously as their father and mother.

READING FOR DETAILS

In working with the last two pages you searched for the main idea in paragraphs. Many times in your reading all you will need to look for are main ideas. There will be other times in which you will need to read for details. In such cases, your first step in reading a paragraph is to find the main idea; and the

second step is to find the details that tell more about this main idea. Think of the main idea as the stem in a bunch of grapes, and the details as the grapes that cluster about the stem.

Read the paragraph below to find the main idea, and then the details that go with it.

Many things happen to raw hides before they can be made into shoes. First the hide of the animal is removed and sent to a tannery. Here it is soaked in

water to soften and clean it. Then the hide is soaked again in a solution of lime to loosen the hair. The hair is then removed by scraping machines.

Main idea: Many things happen to raw hides before they can be made into shoes.

Details:

1. Hide removed, sent to tannery.
2. Soaked in water to soften and clean.
3. Soaked in lime solution to loosen hairs.
4. Hair removed by scraping machine.

Read the article below to find the main idea and details in each paragraph. After reading each paragraph, write the main idea and the details for that paragraph. Do not write all of the words in a sentence that gives a detail. Just take out the important part and write that. An outline is given for your use in working with the first paragraph.

How Pencils Are Made *

1. The "lead" in our pencils is made from graphite and clay. The graphite comes from Mexico and Ceylon. It is ground into a very fine powder. Then the graphite and clay are mixed together into a dough. The dough is pressed through small holes just the size of the lead in your pencil.

2. The graphite and clay dough comes out like a long string. It coils up like a wire, around and around. A man straightens it out and snips it into pieces the right length for your new pencil. Then the "lead" is heated to make it tough. It is heated to 2,000 degrees Fahrenheit. This heat makes the "lead" hard.

3. Your pencil is a wooden sandwich with the "lead" for the filling. A good pencil must be made of cedar. Only cedar is tough enough and free from warp and knots. For five-cent pencils, incense cedar from the West Coast is commonly used. Some companies have their own timber tracts and mills.

4. At the mills the wood is sawed into pieces seven and a quarter inches long, half as thick as your pencil and wide enough for six or eight pencils. These are called "slats." They are seasoned for six months and then shipped to the factory for the next process.

5. Grooves are cut in these wooden slats. The groove is half a circle, half as big around as the "lead" of your pencil. A man puts the "leads" into the grooves, one "lead" in each groove. Another piece of wood or "slat" is grooved just like the first one. It is

covered with glue. It is fitted over the first piece with the "lead." The two pieces are next put into a press to hold them close together while the glue hardens.

6. The next step is to cut out the pencils. A machine does this. The knives turn around 10,000 times in one minute! Then the pencils are sandpapered. Next they are painted and varnished by machinery. Your pencil may have 15 coats of paint on it.

Paragraph No. 1

Main idea: _____

Details: 1. _____

2. _____

3. _____

4. _____

Get a separate piece of paper. Make outlines for the other paragraphs, using the form above.

* Nichols, Helene, "Pencils," *Story Parade*, October, 1948, pp. 38-39. Copyright 1948, by Story Parade, Inc. Excerpts reprinted and adapted by permission.

WORKING WITH SOCIAL STUDIES WORDS

The words below are used frequently in *social studies* and *history* textbooks. If you know the pronunciation and meaning of these words, it will be helpful to you when studying in these books.

Work out the pronunciation of each word. Say the word distinctly. Study the meaning of the word and think about it.

adjourn ə jern'	To put off until a later time, or to stop business for a time.
amendment ə mēnd'mēnt	A change, correction, or addition to a proposal or a government bill.
annex ə neks'	To join or add a small thing to a larger thing.
authority ô thôr'î tî	In <i>government</i> , the head or group having power to give orders, command, and force obedience; the right to act officially.
blockade blök ād'	The shutting up of a place by troops or ships to prevent people or supplies from passing in or out.
campaign kām pān'	A series of military acts forming a distinct stage of war, or the efforts of a political party to get its candidates elected.
civilian sî vil'yān	One not in the armed services.
compromise kôm'prô mîz	A settlement reached by agreement of the people concerned or their representatives.
commission kô mîsh'ūn	In <i>social studies</i> , authority given to act in an official capacity to accomplish some specific duty.
Confederation kən fed'ər ā'shən	The name given to the union of the provinces when they became the Dominion of Canada in 1867.
delegate dēl'ē gāt	One sent for and given the power to act for another.
depression dē prēsh'ūn	A period of hard times financially, when there is much unemployment, trade is reduced, and poverty is widespread.
disarmament dis ār'mā mēnt	Laying aside or taking away weapons.

See if you know the meaning of each of these words as it is used in *social studies*. Choose one word to write in each blank space. Add *s* or *ed* if necessary.

- Six other provinces have joined _____ since 1867.
- During an election _____, the leaders of each party travel many miles to speak to people.
- Britain _____ Acadia in 1713.
- In order to make the law fairer, the government suggested an _____ to the bill.
- The judge _____ the court for two hours for lunch.
- Both children wanted the apple: their _____ was to share it.
- A complete _____ of all the harbors of Canada would require hundreds of warships and submarines.
- A general in the army has _____ to give orders to the soldiers under him.
- At the end of each war the winning side insists on _____ of all of the defeated troops.
- All of us who are not in the armed services are _____.
- Following the first World War there was a period of hard times financially. This period was called a _____.
- All the people in Parliament cannot go to a meeting in a distant country. So they send one person to act as their _____.
- Our Minister of External Affairs was sent to England to help in solving a certain problem. He was given a _____.

UNIT FOUR

IN THE DAYS OF CONFEDERATION



The story below has its setting in the days of Confederation. The setting is historically true. Whereas the boy in the story is an imaginary character, a circus did visit Prince Edward Island at the same time as the conference was being held, and such a message was delivered.

A very close friend is sometimes called a *crony* (krō ni).

A person who speaks in a disconnected way so that what he says does not make sense is said to be *incoherent* (in'kō hir'ənt).

A person who is not interested in things, or who may be too tired to care about anything, may be said to be *listless* (list'lis).

Lofty (lof'tē) means very high and sometimes grand.

In olden days a pen which was made from a feather was called a *quill* (kwil).

If a person feels he has been treated unfairly, he sometimes becomes *resentful* (ri zent'fəl).

Beginning time: Hr. _____ Min. _____

A MESSAGE FOR CHARLOTTETOWN

Jim was feeling bored and resentful. Outdoors the sun was shining brightly, as he gazed around the room which two months ago he had thought was the most interesting place in the world. All he saw now was the crack in the window pane, the heaps of paper on Mr. Watson's desk, and an assortment of pens and pencils. Everything looked dusty, even the Morse apparatus which stood in the corner. The only clean thing appeared to be the new sheet on the calendar.

"Come now, my boy," Mr. Watson had called as he entered the office early that morning. "Tear off the calendar. Off with the old and on with the new. It's September 1st, 1863, and an important day in Charlottetown, if I mistake not."

Jim had torn off the sheet, muttering to himself that he thought it might be an important day but yet he had to stay in this stuffy, dusty office. Yesterday a circus had come to Charlottetown. This was the first time Jim had ever seen elephants, lions, tigers, or seals in all the thirteen years he had lived. Last night when the boat had docked, he and his two younger brothers had watched all the animals and circus people land. The crowd was so big that Jim had had to hoist seven-year-old Arthur to his shoulder. People had

driven in their buggies from all parts of the island. Every hotel and boarding house was full.

But Jim knew Mr. Watson was not thinking of the circus or all the people. Jim had admired the *Heather Belle*, which had arrived from Nova Scotia bringing delegates to a conference, and now lay at anchor in the harbor. The delegates were going to discuss whether the Maritime provinces should unite and form one government. This morning, on his way to work, Jim had recognized the mast of the *Prince of Wales* which had brought the New Brunswick delegates.

Mr. Watson and his cronies had been arguing about the idea of the union of the three provinces all summer. And now Mr. Watson had gone to watch the delegates arrive at the Mansion House, and had left Jim in charge of the office. Normally Jim would have been very proud to have this great honor, but this morning he had hoped he would be allowed to go to watch the circus parade.

Listlessly, he picked up the quill and began to enter the figures into the ledger. Suddenly the Morse apparatus began to click. Although Jim now knew the dots and dashes of the Morse code perfectly, he had only taken messages under the supervision of Mr.

Watson or Ben, the senior assistant. But Ben was on holiday. Carefully Jim pressed the button which indicated that the message was being received. He wrote each letter carefully. It was a very long message and came from Montreal. When he came to the "M" in the signature which began John A., he knew that this was a message from John A. Macdonald, the Prime Minister of Upper Canada. He had been so intent on taking down each letter that he had not understood the message. Now he gulped with surprise, grabbed his cap, but mindful of Mr. Watson's instructions, locked the door carefully.

He ran all the way to the Mansion House, pushing through the crowds gathering to watch the circus parade. Dodging the people clustered on the steps, he arrived panting at the lobby. "Hey now, lad, take it steady," called Mr. Watson. Jim was relieved to see him but was so breathless that he was incoherent.

Hr. Min. Sec.

Ending time: _____

Beginning time: _____

No. words $\frac{739}{\text{No. seconds}} \times 60 = \text{_____WPM}$

COMPREHENSION QUESTIONS

1. Where did Jim live? _____

2. Why was Jim resentful? _____

3. Why was the meeting of delegates held? _____

4. Why had all the people come to Charlottetown? _____

5. What was the news in the telegram? _____

6. Why was Jim anxious when the bell rang? _____

7. Why did Jim not understand the Morse message straightway? _____

Seeing the name on the envelope, Mr. Watson cried, "Come with me." Together they entered the lofty room where the delegates sat round a big table.

"This telegram I have just received states that eight members of the cabinet of Canada are arriving today on the *Queen Victoria*," Mr. Gray announced. Excited chatter broke out immediately. The door opened again and another messenger whispered to the chairman. Then came another announcement. "The *Queen Victoria* has just dropped anchor. Let us adjourn the meeting and greet the newcomers."

Jim found himself in the street once more. Mr. Watson smilingly put his hand on Jim's shoulder and said, "Well, my boy, now you may see two great sights. The spectacle of the circus parade will be followed by that of the meeting of men who are about to make a nation."

8. List the names of the three ships mentioned in the story and opposite each indicate the province from which they came.

Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

Write your answers to these questions on a separate piece of paper.

1. List all the clues that indicate when this incident took place.
2. List all the clues that reveal that Charlottetown is on an island.
3. Give three reasons why you think a circus visited Charlottetown so rarely at the time of the story.
4. Why do you think the room was described in detail?
5. Write three sentences describing Mr. Watson.
6. What did Mr. Watson mean when he said, "men who are about to make a nation"?
7. What difficulties would the delegates from Canada experience because the visit of the circus coincided with the conference?
8. Which do you think was the more important happening, the coming of the circus, or the meeting of the delegates? Why?



WHY DID THE PROVINCES UNITE?

You have just read an imaginary story in which Jim carried a message to the Charlottetown conference. Now you are about to read an historical selection which answers the question, "Why did the Provinces unite?" You should read this selection quite differently from the way you read the story.

1. This selection has no boldface or italicized headings within it. So the first thing to do is to glance through the entire article in search of the main idea in each paragraph. Underline the most important idea in each paragraph during this first reading.

2. Read the entire selection to find out the details which it has to give you about each of the main ideas.

3. As you read you will find paragraphs here and

there in which the author departs from stating historical facts and discusses his opinion or someone else's opinion about something. Notice which paragraphs contain statements of fact, and which contain sentences expressing opinion.

4. Since this selection requires careful study, you are not asked to time yourself. Read closely for main ideas and details.

A *bevy* (bev'ē) means a small group.

A *civil war* (siv'əl wôr) is a war between two groups within the same nation.

If we help or encourage the growth of something we are said to *foster* (fos'tər) it.

A *horde* (hórd) means a large group of people or

animals. They usually rely on taking things by force.

If someone is opposed or unfriendly, we say he is *hostile* (hos'til). *Hostility* (hos til'ə tē) is the feeling or state of being opposed or unfriendly.

When something is sure to happen and cannot be avoided we say that it is *inevitable* (in ev'ə tə bəl).

THE CAUSES OF CONFEDERATION

The idea of the union of the provinces of British North America was not new or original in the eighteenth century. Several statesmen had suggested the idea earlier in the century. To many people it appeared too impractical and expensive to undertake. Some provinces, proud of their two centuries of history, feared they might be swamped in the larger union and might lose their independence. By 1864, however, various factors were making union inevitable.

Many people believed that the way to both prosperity and union was to build more railways. In most areas travel was still by road, river, lake, or canal. In 1850 there were only fifty-six miles of railway, but by 1860 two thousand miles had been constructed. Villages which were fortunate to be on or near the railway line became prosperous. The idea of a railway from the Atlantic to the Pacific was no longer an impossible dream. Though this railway was not built until after Confederation, it made possible the union of provinces thousands of miles apart.

At this time, too, thousands of pioneers were journeying along the Oregon trail and settling in Oregon, south of British Columbia. The Hudson's Bay Company had established many fur-trading posts on the Colum-

bia river, but when the settlers came the fur trade was ruined. The boundary between British Columbia and the United States was fixed at the forty-ninth parallel in 1846. Many of the pioneers, however, occupied land north of this border. In addition, hordes of prospectors had flocked into British Columbia in 1857 during the Cariboo gold rush. Politicians in the eastern provinces then became anxious that they might lose the western lands to the United States. This fear was another reason why many politicians promoted the development of a transcontinental railway.

Though today Canada and the United States are good neighbors, this was not always so. From 1861 to 1865 the northern states and the southern states had been fighting a bitter civil war. The northern states suspected that Britain favored the southern states, and so hostility grew. When the northern states were successful, the people of the British provinces feared that the victorious army might be used to conquer Canada. They realized that if they were united under one government they would be better able to defend themselves against possible invaders.

The hostility between the provinces and their southern neighbors ended the free entry of many goods

into the United States. As a result, the colonies hoped to promote interprovincial trade to make up for the loss of the American market. Such trade would be fostered by a single national trade policy, especially if this could be ensured by railway building.

The people of Upper and Lower Canada had a single legislative assembly with an equal number of representatives from each province. By 1860 the population of Upper Canada was considerably larger than Lower Canada, and thus many politicians began to agitate for representation in proportion to population. The people of Lower Canada then became afraid that they would have to give up the French language and the Roman Catholic tradition. The two major parties at that time, the Conservatives and the Reformers, were so evenly balanced that neither side maintained a majority in Parliament long enough to look after

the business of the country. Many people thought that Confederation would solve this political problem.

It was fortunate for Canada that a bevy of great statesmen worked together to achieve confederation. The "Fathers of the Confederation" were John A. Macdonald, George Brown, Georges Cartier, Alexander Galt, Thomas D'arcy McGee, Charles Tupper, and Leonard Tilley. Though many of them had been political enemies, they agreed to put aside their differences and to work together for the good of the cause. Many conferences and discussions took place, and several visits to London were made by these leaders to consult with the British Cabinet. Finally, on July 1, 1867, the British North America Act, which united Canada, became law. Each year on July 1 Canadians celebrate the national birthday with a public holiday.

ACTIVITY 1—LISTING MAIN IDEAS AND DETAILS

There are seven paragraphs in the selection. Find the sentence in each paragraph which contains the main idea. On a separate piece of paper list these main ideas in order. Write each one in your own words. When you have finished, examine the list to see if it makes a fairly good summary of the selection. Try to restate the list without looking at the sentences you wrote.

Now write the main idea for the first paragraph and list the important details under it as you did on page 44. Do the same thing with the second and third paragraphs.

ACTIVITY 2—FINDING STATEMENTS OF OPINION

There are many facts in this article that actually happened. There are several sentences, however, that tell someone's opinion or ideas. For example, in paragraph one the author says, "To many people it appeared too impractical and too expensive. . . ." This was the opinion of these people and they were not necessarily right. In this passage you have read

that many people "believed" or "feared" something. These sentences state opinions of people living at the time of Confederation.

There are several other sentences expressing opinions. Write at least six sentences below which are statements of opinion.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Applying What You Have Learned About Reading Social Studies Material

In reading in your *social studies* books, you may find sections containing many paragraphs without any boldface or italicized headings between them. When this happens, it is helpful to find the main idea of each paragraph and make a note of it. Your list

of main ideas will give you a summary of important points in the entire series of paragraphs.

Be careful also in deciding what is fact and what is opinion in all that you read. This is particularly necessary when reading *social studies*.

THE WEST IS NOW SPANNED WITH TELEGRAPH WIRES

On page 46 you read how an important telegram was sent to a conference through the use of the telegraph. Before this time, messages had to be carried on foot or on horseback. The use of electric wires for sending messages was comparatively new at the time of Confederation.

Do you understand how the telegraph works?

The selection below explains the telegraph. It is similar to the material which you find in certain parts of your *science* textbooks. Reading material of this type is the most difficult kind of material which you have to read. It must be read slowly and thoughtfully as suggested below.

1. First, read the boldface headings to find out what topics are discussed in the selection.

2. Study the first diagram, noticing especially the parts that are labeled.

A machine that prints a telegraph message like a typewriter is called a *teletypewriter* (těl'ê tîp'rît êr).

When a person changes one language into a different one, he is said to *translate* (trāns lāt').

A person who does a certain kind of work is called an *operator* (ôp'êr ā'têr).

If we push something down, we are said to *depress* (dê prês') it.

HOW DOES THE TELEGRAPH WORK? *

WHO INVENTED THE TELEGRAPH?

Samuel F. B. Morse, professor of art, was deeply interested in the idea of an electric telegraph. He felt that there must be a way to make electricity carry a message over a wire. He was sure that there was a great need and a great future for such an invention. He spent many difficult and bitter years at the task. Finally he succeeded in making a practical electric telegraph. This is the plan he used:

HOW DOES THE TRANSMITTER WORK?

The diagram to the right will help you to understand the telegraph. First, look at the coil at Station A. This coil consists of a wire wound around an iron rod. When electricity passes through the wire; the rod attracts metal. It is an *electromagnet*.

Just above this coil is one end of a *metal bar* which is on a pivot, like a seesaw. There is a *battery*, to supply electricity. And there is a *key*, as it is called, which the telegraph operator can push down with his finger. The wires from Station A stretch over to Sta-

3. Read the first section to find the answer to the question, "Who Invented the Telegraph?" Then read the next section, "How Does the Transmitter Work?" In working with this section, read just one sentence at a time. If it mentions something shown in the diagram, look back at the diagram after reading the sentence. When you are sure that you understand that sentence, read the next one in the same way. Stop and think about each sentence after you have read it to make sure that the meaning is clear to you.

When you have finished reading the entire section, see if you can give the explanation to yourself in your own words. If not, go back and reread the parts that you need in making your explanation complete.

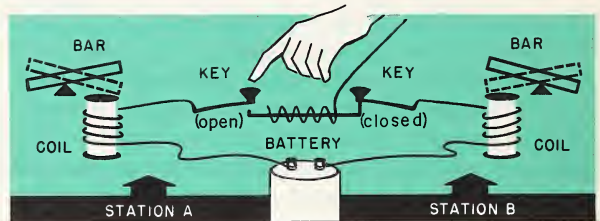
4. Work with each of the remaining sections in the same way that you worked with the second.

A union of two or more things is called a *combination* (kôm'bî nā'shûn).

The offspring of an ancestor or certain source is called a *descendant* (dê sên' dânt).

A metal pin on which something turns is called a *pivot* (pîv'ût).

When something is highly important in carrying out a process or plan, it is said to be *vital* (vî'tâl).



tion B, where there is another coil, pivoted bar, battery, and key.

Suppose the operator at Station A wishes to send a message to the operator at Station B. He pushes down his key. The electric current flows from the battery to the coil at A. The coil becomes a magnet. It attracts the end of the metal bar. The end of the bar drops down toward the coil but is soon stopped. As it hits the coil there is a loud "click."

The electric current then passes along the wire to Station B. The coil at B now becomes a magnet. This coil pulls down its pivotal bar. This bar in turn makes a loud "click" just like the one at Station A.

Now the operator at Station A lets up his key. The path for the electricity is broken: the electric current

*Based upon material prepared for this book by Burnett Cross.

This clicking is what gives the coil-and-bar apparatus the name of telegraph *sounder*.

To use this system of keys and sounders for carrying messages, Morse developed the “dot-dash” code that bears his name. He represented letters of the alphabet by combinations of dots, dashes, and spaces. Letter *A*, for example, was a dot and a dash (·-). Letter *B* was a dash followed by three dots (-···); and so on.

If you listen to a telegraph operator sending a message in Morse Code—or receiving one—you'll hear a stream of clicks. They may mean nothing to you; but here is what is going on, at high speed.

To send a Morse Code “dot,” the telegraph operator presses down his key—and lets it spring back up at once. As he does so, his sounder goes “click-click,” faster than you can say it. The first “click” sounds as he presses down his key and the electric current flows;

the second “click” sounds as he lets up his key and the current stops.

To send a "dash," the operator presses down his key --and *holds* it down for a moment before releasing. His sounder now goes "click . . . click."

Thus when the operator sends letter $A(.-)$, he hears his sounder go “click-click, click . . . click.” Letter $B(-\cdots)$ is “Click . . . click, click-click, click-click, click-click”; and so on.

WHAT ARE MODERN DEVELOPMENTS?

You may have noticed on a television news program a kind of typewriter, minus a typist, clattering away and typing out news bulletins. This is a descendant of Professor Morse's electromagnetic telegraph: the *teletypewriter* combines telegraph and typewriter.

Instead of sending Morse Code, the operator of a teletypewriter simply works a typewriter keyboard.

When the letter A key is depressed on this keyboard, all other teletype machines connected to it type letter A, as one machine. Actually the teletype machine translates the typed message into code and sends it out on the telegraph lines. The receiving machines translate the code back into letters.

ACTIVITY 1—LISTING STEPS IN A PROCESS

1. List on a separate piece of paper the steps in sending a message from Station A.
2. List on a separate piece of paper the steps which show what happens at Station B.

ACTIVITY 2—USING THE DOT AND DASH SYSTEM

Looking at the Morse Code below, tell:

1. How would you send the letter *n* to another station? _____

2. How would you send the letter *d* to another station? _____

3. How would you send the letter *g* to another station? _____

ACTIVITY 3—TRANSLATING

- Here is a Morse Code sentence. What does it mean?
... , . . . , - , - , . . . , . , - , - , . , - , . , - , - , - , -

- What is the difference between *I* and *O* in the code?

- Write this sentence in Morse Code:
I have 9 books.

MORSE TELEGRAPH CODE

A.—	F.—	K.—	Q....	V....
B....	G---	L—	R. .	W---
C. .	H....	M--	S...	X....
D---	I..	N--	T-	Y.. .
E.	J----	O. .	U---	Z... .
		P.....		
1.---	3.....	5---	7----	9----
2.....	4.....	6.....	8.....	0—

MESSAGES AND JOURNEYS

You have been reading about Confederation and messages and journeys in those days. You have also been reading about the invention of the telegraph and how it works. You will appreciate more what you have read about these subjects if you work with some numbers that have to do with them. Below are some problems related to these subjects. Study each problem carefully to find the interesting facts it contains.

You have had practice in using four different procedures in reading problems. This time another is added.

5. Estimate the answer.

After reading and rereading to decide upon what to find, facts given, and the process to use, you should estimate your answer. This will give you some idea of what your computed answer should be. If you find that there is a great difference between your estimated answer and the answer that you get from computing the problem, then you will know that you have made a mistake. The mistake may have been made in estimating or it may have been made in computing.

If the problem is one in which you plan to add, subtract, multiply, or divide, you should use round numbers in estimating your answer. For example, if one of the numbers were 313 you would "round" it to 300. If the other number were 42, you would

"round" it to 40. On the other hand, if one of the numbers were 389 and the other were 49 you would round the numbers to 400 and to 50. You have learned how to round numbers in the elementary grades, so no additional explanation will be given for doing this.

Rounding the numbers makes it easy for you to work with numbers mentally, and still the answer will not be too far from the answer which you get by working with the exact numbers as they are given in the problem.

Read and reread each of the problems below to get the information that you need to place under each of the headings *To Find*, *Facts*, and *Process*. Then estimate your answer and write that under the heading *Estimate*.

Ask yourself if this answer is *reasonable*. Could it be about that much? If so, go ahead and compute the problem. If not, read and think the problem through again and make another estimate.

In working with these two pages, you should compute each problem on a separate piece of paper as soon as you have made the estimate. Then compare your estimate with your computed answer to see how near you came to estimating the correct answer.

If your estimate and answer are too far apart, check both carefully until you find your mistake.

PROBLEMS ABOUT SUBJECTS IN THIS UNIT *

1. The distance from Ottawa to Toronto by saddle paths was approximately 250 miles at the time of Confederation. If a man walked 32 miles a day, how long would it take him to make the trip?

To Find

Facts

Process

Estimate

2. In the year of Confederation the people of Canada numbered about 3,300,000, of whom 50 per cent lived in Upper Canada. What was the population of Upper Canada in 1867?

To Find

Facts

Process

Estimate

* Based upon material prepared by Francis J. Mueller.

3. In 1871 the total population of Canada was approximately 3,689,300. French-speaking Canadians formed 31 per cent of the total. What was the total French-speaking population?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

4. Jim's uncle had a small farm covering 1,306,800 square feet of land. How many acres did he have (1 acre = 43,560 sq. ft.)?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

5. A man could ride a horse about 80 miles a day. How long would it take the rider to make the 250 mile trip to Toronto?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

6. Suppose that a man drove his car at an average of 45 miles per hour. How long would it take him to make a 250 mile trip?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

7. During the year 1958 the Canadian telephone systems handled 8,513,400,000 local calls and 194,186,000 long-distance calls. What was the total number of calls in 1958?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

8. In 1958 the population of Canada was 17,048,000. There were then 5,118,290 telephones in use in our country. How many telephones were there per 100 of the population?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

9. In 1911 there were 303,000 telephones in Canada. Now there are about 5,700,000 telephones in use in our country. How many more phones are in use now than in 1911?

<i>To Find</i>	<i>Facts</i>	<i>Process</i>	<i>Estimate</i>
----------------	--------------	----------------	-----------------

Applying What You Have Learned About Reading Problems

In working with problems in a *mathematics* book it is advisable always to estimate your answer before computing the problem. If your estimated answer seems reasonable, then your reading for meanings has probably been well done and your thinking about these meanings has probably been correct.

When a problem seems difficult to you, write the four headings on a separate piece of paper—*To Find*,

Facts, *Process*, *Estimate*. Then read and reread the problem until you find the necessary information to place under each heading. Take plenty of time to find what you need to place under these headings, and the most of your work will be done. The computation of the problem is your last step, and the one that takes the shortest amount of time. Careful reading is most important in problem-solving.

DIVIDING WORDS INTO SYLLABLES

On pages 40 and 41 you had practice on some of the easiest ways of dividing words into syllables. Now you will have practice on three additional ways of deciding at what points you can break words into syllables.

Guide 5: Considering Consonant Blends and Speech Sounds as Single Consonants

On pages 27 and 28, you learned that a consonant blend consists of two or three consonants that are blended together to make just one sound. Tr and str are examples of consonant blends. A speech sound consists of two consonants that make a new sound entirely. Ch and th are examples.

Since a consonant blend or a speech sound is just *one* sound, you should usually consider the blend or sound as a single consonant when you divide a word. Sometimes the word will then be divided according to Guide 3, which calls for dividing between separately sounded consonants. For instance, the word *instruct* is divided in|struct because str is considered as *one* consonant. Other words with consonant blends or speech sounds may be divided according to Guide 4, which calls for dividing before a single consonant when the consonant falls between two sounded vowels. For instance, the word *father* is divided fa|ther.

Draw a line under the blend or speech sound in each of the words below. After you are sure you have found the blend or speech sound, draw a line between the syllables.

describe	complete	conclude	either
author	extreme	express	explain
farther	progress	increase	reflect
improve	degree	country	enchain

Note these exceptions to Guide 5: When a word ends in ble, gle, le, ple, and similar formations, these letters make a syllable by themselves, as in cra|dle.

Divide these words:

bundle	trouble	people	mangle
--------	---------	--------	--------

Guide 6: Dividing Between Prefixes, Root Words, and Suffixes

Prefixes, root words, and suffixes are syllables or combinations of syllables in themselves. When syllabifying a word made up of these elements, you often divide between them.

Below are some root words with prefixes. Divide them according to the guide.

unless	reread	embed	import
exchange	enlarge	recall	react
unfair	preview	submerge	review
inquire	disease	inside	context

There are some exceptions to this guide, especially in the case of suffixes. The root word often gives a final consonant, especially t, to a suffix. The word *active*, for instance, is divided ac|tive because it would be difficult to pronounce act|ive. Once you get a word broken into small enough parts so that you can test various ways of pronouncing it, you usually won't have any trouble finding the cases in which the final consonant of the root word has been added to the suffix to make pronunciation easier.

In the following list, there are words to which suffixes have been added. Two of the words are exceptions to the guide. When you divide the words, see if you can find the two exceptions.

leaflet	blockade	safely	wideness
statement	threaten	helpful	buzzing
freedom	rooter	actor	grayish
harmful	headings	sailing	collection

Applying All You Have Learned About Dividing Words into Syllables

Here is a summary of the things you have learned about dividing words into syllables.

1. Divide between words in a compound word.
2. Divide between double consonants.
3. When two separately sounded consonants come between two sounded vowels, you usually divide between two consonants.
4. When one consonant comes between two sounded vowels, you usually divide just before the consonant.
5. Do not split blends or speech sounds. Consider a

- blend or a speech sound as one consonant. (Treat ble, gle, ple, and similar formations as syllables.)
6. Divide between a root word and its prefix or suffix.

Divide each of the words below. Then place a number on the line at the left of the word, to show which of the principles above you used in deciding where to divide the word. If two principles apply to the same word, write both numbers before the word.

The first word has been marked, to show you how the exercise should be done.

<u>4</u> divide	_____ correct	_____ impress	_____ machine
_____ practice	_____ trooper	_____ affair	_____ program
_____ fossil	_____ corral	_____ abrupt	_____ beneath
_____ admire	_____ worthless	_____ quickest	_____ extend
_____ mammal	_____ reptile	_____ saddle	_____ brutal
_____ compute	_____ pretend	_____ replace	_____ express
_____ yearly	_____ inland	_____ luckless	_____ message
_____ annoy	_____ transship	_____ gallant	_____ fortress
_____ lobby	_____ mainly	_____ vital	_____ defeat
_____ Watson	_____ scanning	_____ meanwhile	_____ return
_____ buggy	_____ reread	_____ depress	_____ virus
_____ symbol	_____ railroad	_____ mature	_____ outline
_____ notice	_____ connect	_____ rifle	_____ sandstone
_____ finger	_____ signal	_____ arrange	_____ pasture
_____ magnet	_____ earthen	_____ viewpoint	_____ careful
_____ current	_____ fissure	_____ complex	_____ candle
_____ moment	_____ pattern	_____ largest	_____ unload
_____ outbreak	_____ deeper	_____ effect	_____ partly
_____ vocal	_____ chapter	_____ limestone	_____ outcome
_____ control	_____ pressure	_____ skillful	_____ surround

WORKING WITH MATHEMATICS WORDS AND PHRASES

The words and phrases below appear in widely used *mathematics* textbooks at your level. No doubt they are in the *mathematics* book which you are using.

Work out the pronunciation of each word or phrase. Next study the meaning which each word or phrase has in *mathematics*.

centimeter
sěn'tǐ mē'tēr

Ten centimeters equal one decimeter.

consumer
kǒn sūm'ēr

One who uses goods.

currency
kūr'ēn sǐ

Money in bills or coins which pass from hand to hand in buying and selling.

damages
dām'jǐ ěz

The estimated payment in money by one responsible for injury to another person or harm to his property.

decimeter
dēs'ǐ mē'tēr

Ten decimeters equal one meter.

micrometer
mī krōm'ē tēr

An instrument used for very exact measurement.

mill
millimeter
mǐl'ǐ mē'tēr

One-tenth of a cent.
In the metric system of measuring length, ten millimeters equal one centimeter.

BONDS

bond
bǒnd

A special kind of note stating that on a certain date the buyer will receive the face value of the bond.

maturity value
má tǔ'rǐ tǐ vǎl'ǔ

The maturity value of a Canada Savings Bond is the original amount plus the interest each year for the time limit of the bond.

redemption value
rē dēmp'shǔn

If a Canada Savings Bond is cashed or redeemed any time before the time limit stated on the bond, you receive the original price plus interest to the time of redemption. This is called *redemption value*.

INSURANCE

annual premium
prē'mǐ ūm

The amount paid each year for a contract of insurance.

insurance
ǐn shōōr'ǎns

A contract promising to pay a stated amount in case of damage, injury, or death.

policy
pǒl'ǐ sǐ

The insurance contract itself is called a *policy*.

See if you know the meaning of each of these words as it is used in *mathematics*. Choose one word to write in each blank space. Add *s* if necessary.

- Mr. Black's car ran into Mr. Skinner's fence and knocked it down. Mr. Black paid Mr. Skinner
_____.
- Mr. Lane had to measure the exact thickness of a thin piece of tin. He used an instrument called
a _____.
- The meter is used as the standard unit of length
in some countries. There are 10 _____
in 1 meter.
- There are 10 _____ in 1 decimeter.
- There are 10 _____ in 1 centimeter.
- There are 10 _____ in 1 cent.
- Mrs. Rose bought groceries at the grocery store which she took home and used on her table. She
was a _____.
- She did not write checks for the groceries. She
paid with _____.
- Canada Savings _____ are issued each year.
- The _____
of a \$1,000 bond is \$1,725.
- Mr. Hodgson had a \$1,000 bond which he sold
after 5 years. The _____
was \$1,235.
- Mr. Harvey took out life _____
for himself and his wife.
- The company gave him one _____
for himself and one for his wife.
- He paid an _____
of \$75.00 for each policy each year.

WORKING WITH SCIENCE WORDS

The words below are in nearly all *science* textbooks at your level. You will be able to read better in the *science* books that you use, if you can pronounce all of these words correctly, and if you understand their meanings as used in *science*.

Study the pronunciation of each of these words. Say the word to yourself, pronouncing it distinctly. Then read the meaning of the word and think about it.

heredity hẻ rẻd'ỷ tỡ	Inheritance of characteristics from parents.
immunization ỉm'ủ nỡ zỏ sh'ủn	Production of antibodies in the blood to protect against disease.
insecticide ỉn sẻk'ỏ tỡ sỡd	A preparation used in killing insects.
metamorphic mẻt'ỏ mỏr'fik	The name given to rock which has been changed by heat or pressure.
Palomar pỏl'ỏ mỏr	The name of a mountain with a famous observatory in Southern California.
paramecium pỏr'ỏ mẻ sh'ủm	A one-celled animal that lives in stagnant water.
parasite pỏr'ỏ sỡt	A plant or animal living in or on another organism.
planetarium plỏn'ẻ tỏr'ỷ ủm	A building in which a projector throws lights on the ceiling to represent stars.
pollination pỏl'ỷ nỏ sh'ủn	Supplying a flower with pollen.
rotation rỏ tỏ sh'ủn	The turning of the earth around its axis.
seismograph sẻz'ỏ mỏ grỏf	An instrument which detects and records earthquakes.
tuberculosis tủ bủr'kủ lỏ sỡs	A disease in which bacilli attack the tissues, most often in the lungs.
turbine tủr'bỡn	A part of a machine which produces mechanical energy. Many hundreds of electric plants are run by steam turbines.
typhoid tỷ fỏid	Typhoid fever is a disease caused by a germ found in polluted water, milk, or food.
uranium ủ rỏ nỡ ủm	A radioactive element of the chromium group. This precious metal is used in making atomic energy.

See if you know the meaning of each of these words as it is used in *science*. Choose one word to write in each blank space. Add *s* if necessary.

- One of the scientists in the observatory knew there had been an earthquake in the South Sea Islands by reading the _____.
- John used an _____ to kill the beetles on his mother's roses.
- Insects that feed on trees are _____.
- Marble is _____ rock because it has been changed by heat.
- Bees supply _____ to flowers.
- Electric power plants make use of steam or water _____ to produce electric energy.
- If you examine a drop of pond water under a microscope, you may be able to see a one-celled animal called a _____.
- If you want to get a good view of the stars, you should go to a _____ and look at the sky represented on the ceiling.
- Your brown or blue eyes came to you through _____.
- Mr. Stover works in a famous observatory which is on Mount _____.
- Mrs. Jones had her daughter vaccinated for scarlet fever. She believed in _____.
- Many people are searching these days for deposits of _____, a radioactive metal.
- The earth makes one _____ every 24 hours.
- Don't ever drink polluted water. It may have _____ fever germs in it.
- Mrs. Jenner has a disease of the lungs called _____.

OUTLINING PARAGRAPHS

You have had practice in finding and writing the main idea in a paragraph, and in finding and listing details which give additional information about a main idea.

The next step is to write the main idea and details in the form of an outline.

1. Write the main idea first of all and number it with a Roman numeral *I*, if it is the first paragraph;

II, if it is the second paragraph, and so forth.

2. List the details which tell more about the main idea in as few words as possible. The first detail under a main idea has *A* placed before it, the second detail has *B* placed before it, and so on.

Read the article below and outline the last three paragraphs. The first paragraph has been outlined for you.

The Camel

The camel is a queer-looking animal. He has a body something like that of a horse, except that there is a large hump on it. His awkward neck and knobby legs are too long for his body. Rough hair that always looks uncombed hangs down from his neck and chest. His brown beady eyes are small, and his mouth is wide and homely.

Camels will eat anything. A camel's master usually gives him hard dates or dry beans. If he is free to roam, the camel will eat thistles and thorny shrubs. In camp, if not watched, the camel will chew the leather in his harness, eat the cloth in tents, and devour every basket in sight. The big hump of fat on his back can be drawn upon when food is scarce.

The camel can learn but he complains. A camel can be taught to kneel when he is ordered to do so, but he moans and groans all the time that he is kneeling as if he were in great pain. He knows that a load will be put on his back so he begins to complain before the load is even placed there. He groans as loudly for a light load as for a heavy one.

The camel is the most useful animal in hot, dry countries. He furnishes milk and meat for desert peoples. His hair is woven into cloth for robes and turbans. He even provides shelter for families, since their tents are made of camel-hair cloth. Beside all of this, the camel carries loads across the desert sands wherever his master cares to drive him.

I. *The camel is a queer-looking animal*

A. *Body like a horse, except has a hump*

B. *Neck and legs too long for body*

C. *Rough hair hangs from neck, chest*

D. *Eyes small, mouth wide and homely*

II. _____

A. _____

B. _____

C. _____

D. _____

III. _____

A. _____

B. _____

C. _____

In working with the last paragraph, decide on how many details to list, and outline on separate paper.

FACT OR OPINION?

Some people believe everything they read. They think printed statements must be true or they would not be in print. This is far from the truth. The good reader thinks about what he reads and takes care to decide whether statements or conclusions are based on facts or opinions.

How do you know when a statement in print is based on facts? Very often dates and figures are given in a paragraph or article that is based on facts. Sometimes statements are made concerning things that scientists have found out by experimenting, observing, or through carefully using instruments. These statements or conclusions may be accepted as facts. You are also safe in accepting as facts statements that are based on historical records.

Sometimes you will find figures given or facts presented about which there is some doubt. Some-

where in an article or paragraph you may find such a phrase as "it is reported," "it is believed," "it is said," and so forth. In such cases you should hold your decision in regard to the facts given, until you get more evidence.

How can you tell when a statement or conclusion is someone's opinion? Sometimes you'll find the phrase "I think" or "I believe" or "it is my opinion" or "Mr. so-and-so claims" or something to this effect. When you find one of these phrases, you may be sure that the writer is about to give his opinion, or the opinion of someone who claims to have facts but hasn't given them. More often than not an opinion is expressed in a broad, sweeping statement made without any facts to back it up. This kind of a statement sounds as if it were true, but unless it is supported by facts don't accept it as a final conclusion.

Deciding on Fact or Opinion in Statements

Read the statements below. Decide whether each expresses fact or opinion. Write "Yes" after *Fact?* if you think a statement expresses a fact. Write "Yes" after *Opinion?* if you think a statement expresses an opinion.

1. "I have never been so warm before," said Mrs. Stone. "I believe this is the hottest summer we have ever had."

Fact? _____ Opinion? _____

2. It is claimed that home training is the best way of preparing for a job in radio.

Fact? _____ Opinion? _____

3. "You can easily make \$10,000 a year in selling our product during your spare time."

Fact? _____ Opinion? _____

4. As a matter of record we know that aluminum, the third most common element in the earth's crust, cost \$100 a pound in 1885.

Fact? _____ Opinion? _____

5. "There is no such thing as natural ability in public speaking," said Mr. Brown. "This art must be learned."

Fact? _____ Opinion? _____

Deciding on Fact or Opinion in Conclusions

A conclusion is usually also the main idea in the paragraph in which it is found. It is the summing up of details in the paragraph or article. Sometimes conclusions are based on facts and sometimes they are based on opinion. At other times you can't tell for sure whether a conclusion is based on facts or opinion. In such a case more information is needed before you can make a decision.

Find and underline the conclusion in each of the paragraphs below. Decide whether the conclusion you underlined is probably based on facts, probably based on opinion, or whether you would need to have more information before you could decide whether it is probably based on facts or opinion. Then write "Yes" after one of the three questions beneath the paragraph.

1. The population of Canada increased over four times between 1880 and 1960. In the same period the amount of coal we used increased seven times, copper 240 times, petroleum 502 times, and lead 1820 times. We are using up our minerals much too fast.

Probably fact? _____ Probably opinion? _____ Need more information? _____

2. Mr. Stevens claims to have discovered a cure for baldness. He lost his own hair 30 years ago. Since that time he has been working steadily in an attempt to find a way to keep hair from falling. He has at last found it. There is no need for any man to be bald anymore.

Probably fact? _____ Probably opinion? _____ Need more information? _____

3. In olden times women sold bread from door to door. They received from the baker thirteen loaves for the price of twelve. Hence came the term *baker's dozen*.

Probably fact? _____ Probably opinion? _____ Need more information? _____

UNIT FIVE

OTHER WORLDS



This story is of the kind called “science fiction.” It is based on science, but the story, itself, is imaginary. Many people find science fiction highly interesting.

It is fun just to let go of our imagination at times and fancy what may happen some day in the worlds of space. That is what you may do in reading this story about Mars.

A person who has a high capacity for knowledge is said to be *intelligent* (in tē'lǐ jěnt).

Men who are skilled in building bridges, roads, and canals are called *engineers* (ēn'jī nērz').

A person who lived on Mars would be called a *Martian* (mār'shī ān).

An explanation which has not yet been proved is called a *theory* (thē'ō rī).

Beginning time: Hr. _____ Min. _____

THE WONDERFUL DISCOVERY ON MARS*

It was the year 1980 A.D. For twenty years, men from Earth had made trips into space, but no one had reached Mars as yet. Colonel Dixon, one of these space explorers, had already been to the moon. He planned to fly to Mars next and he was taking Mrs. Dixon and his son, Tom, in addition to his crew.

Colonel Dixon hoped to meet the problems of living on Mars so that he and his family might be able to stay for a while. He was even more concerned about others. If he could solve some of the problems of living on Mars, other explorers might stay there long enough to collect needed information about this planet.

There is little oxygen on Mars, but ways of meeting the oxygen problem already had been found. The two problems which Colonel Dixon hoped to meet had to do with climate and food. He knew the climate was so cold that human beings from earth could not live there for long. He also had been told by scientists that it was doubtful if any crops could be raised on Mars.

Different people have different theories about Mars. Colonel Dixon was one of the people who believed that the white patches at the poles were made of tiny flakes of very hard snow. He also believed that the several

hundred lines seen by astronomers were canals. He thought that the ice-caps in the summer melted and filled the canals with water. He believed that the green and red-brown areas on Mars were plants.

So with these ideas in mind, the Dixon family zoomed off to explore Mars.

Soon after the spaceship had left earth, Tom discovered that Jackie, his pet dog, had stowed away on board. His father was annoyed, but it was too late to do anything about it.

Colonel Dixon and the others found Mars to be a desert with great stretches of rock and barren, waterless plains. There were no lakes or rivers and no rainfall. At that season of the year, even the canals were dry.

The crew quickly dug deep into the surface of Mars and built some crude underground huts. Then they unpacked their supplies. Mrs. Dixon soon had everyone feeling “at home.”

“Now if we could only find some water,” said Colonel Dixon.

He was convinced that the famous canals had water in them for three months in the summer when the ice caps at the poles on Mars melted. But what had become of the creatures who had built them? Colonel Dixon explored many acres of the planet and found nothing else which would show that human beings had ever lived there. “Perhaps they, too, built space ships

* Adapted from a story prepared for this book by Enid Johnson.

and moved to some other planet hundreds of years ago," said he.

Every day, Tom took Jackie and went to watch the men exploring the surface of Mars. He was getting used to being so light that he almost floated over the ground. On Mars, he weighed about a third of his weight on earth.

One day, when the members of the crew were exploring near-by, Tom suddenly missed Jackie. He started hunting for his pet.

After a while he found Jackie digging away like mad in some loose light soil behind a huge rock. This was a different place from any at which the men had dug.

Tom called his father to bring the men with their atomic drills. After hours of digging they came to several great underground storage tanks. What appeared to be pipe-lines led away from the tanks.

Many hours later they came to a vast underground meadow, where strange plants were growing. They looked something like the mosses that grow here on earth. Colonel Dixon picked one of these plants and put it in his mouth. "Tastes good!" he said.

"Those early Martians must have been wonderful engineers. See, they have piped water first from their canals to the tanks, and then to this meadow. Probably some thousands of years ago they had what we would call an 'earthquake,' and all this land was covered up."

"But, thanks to Jackie," continued Colonel Dixon, "we have found how they provided themselves with water during the months when their canals were dry. We have found how they provided themselves with food to eat. And we have lived comfortably in our underground homes for quite a few days. I'm satisfied. Back to earth tomorrow!"

Ending time: *Hr.* *Min.* *Sec.*
 Beginning time: _____

No. words 744 × 60 = _____ WPM
 No. seconds

COMPREHENSION QUESTIONS

- What two problems did Colonel Dixon hope to solve?

- What was his theory concerning the white patches on Mars? _____
- What was his theory concerning the lines which astronomers have seen on Mars? _____
- What was his theory in regard to the green and red-brown areas on Mars? _____
- What kind of a country did he and the others find when they landed on Mars? _____
- Where did they build huts? _____
- What did they find underground when they dug down from the spot where Jackie had been digging? _____
- What was Colonel Dixon's theory in regard to the reason why the pipes and tanks were covered with earth? _____

- What was his theory in regard to what had happened to the Martians? _____
- What three discoveries caused him to be satisfied with his trip? _____

Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

- Most scientists believe that the lines which can be seen on Mars are not canals. What else could they be?
- What was Colonel Dixon's most important purpose in taking this trip?
- Do you think Colonel Dixon was sure that he could make the trip to Mars safely? Why do you think he was so sure of a safe journey?
- Why did Tom feel so light when he walked around?
- Why do you think Jackie happened to be digging at the particular spot where he was digging?
- How might the story have ended if Jackie hadn't gone?
- What was the most exciting part of the story?
- Would you ask to go on a trip to Mars if your father were going there to stay for a time? Why?
- At what date do you think spacemen will reach Mars? Why that particular date?
- Where can you find science facts about Mars?

CLIMATE AND THE WORLDS



A



B

The climate of Mars is unlike ours. Mars is more than 50 per cent farther from the sun than the earth is. For this reason, it is much colder. On Mars's equator, the temperature at noon is probably between 50 and 72 degrees. At sunrise and sunset it is around 10 degrees, and the nights are extremely

cold. None of us would be able to live there unless many special things were done to provide us with oxygen, and different kinds of homes, food, and clothing. If anyone should ever attempt to live on Mars, he would have to live a life very different from our lives on earth. And the climate would be one large factor in making this life so different.

Climate causes people who live in different places on our earth to lead different kinds of lives. This is shown in the pictures to the left.

How well can you *read* these pictures? Often you can get information from a picture, as you can from printed words. Try to *read* each of the pictures to find out how the climate affects the food, clothing, homes, and transportation of the people living in the kind of climate shown in the picture.

ACTIVITY 1—EFFECTS OF CLIMATE

Tell how the climate affects the life of people in Picture A.

1. Homes: _____
2. Food: _____
3. Clothing: _____
4. Transportation: _____
5. Occupations: _____

Tell how the climate affects the lives of people in Picture B.

1. Homes: _____
2. Food: _____
3. Clothing: _____
4. Transportation: _____
5. Occupations: _____

The short selection on the next page gives information which you would not be able to get directly from maps. In this selection the author draws several conclusions. When you read the selection, look especially for these conclusions. Decide whether or not you doubt some of them.

Plant life is called *vegetation* (vēj'ě tā'shŭn).

When something goes on without a break, it is *continuous* (kŏn tŭn'ŭ ũs).

A warm climate is *favorable* (fā'vēr ā b'l) to growth of plants.

When we give something for a common purpose we are said to *contribute* (kŏn trīb'ŭt) to it.

Anything that turns around and around is said to *revolve* (rê vŏlv').

When something has been changed in form, degree, or extent we say it has been *modified* (mŏd'ī fid).

Fitness for receiving and holding ideas is *mental capacity* (kā pās'ī tī).

THE EFFECT OF CLIMATE ON PROGRESS*

People who live in the temperate zones have more variety in their lives than those who live in the polar regions or near the equator. As a rule, they have a much higher standard of living, with more and better food. The changing seasons not only provide variety in climate, but produce a type of person with more energy. People living in the temperate zones have more capacity for inventive ideas than those who live where it is either always cold or always hot.

Climate has shaped the course of world history. The frozen wastes of the frigid zones have not contributed any of the leading nations of the world. The struggle for mere livelihood has been too great. The land cannot support a large population. Only in the

sections of the frigid zones where the extreme cold has been modified by favorable winds or ocean currents has any progress been made.

The torrid zone has contributed much to world history, but not as much as could be expected. There is no question that extremes of climate have held back progress. Most of the world's great nations have been located in the North Temperate Zone, where climate has been most favorable.

The vast expanse of Canada stretches through the temperate zone to the frigid zone. Most of the large Canadian cities are in the south, where more favorable climatic conditions exist than those prevailing in the Arctic circle.

ACTIVITY 2—JUDGING AND TESTING CONCLUSIONS

No doubt you found several conclusions in the article above. These conclusions represent the author's thinking. You don't need to accept them just because the author stated them. You are free to pass judgment on these conclusions and to test them to find out whether or not they are correct.

The Activities below will give you ideas of procedures to use in judging and testing conclusions.

Some Great Nations

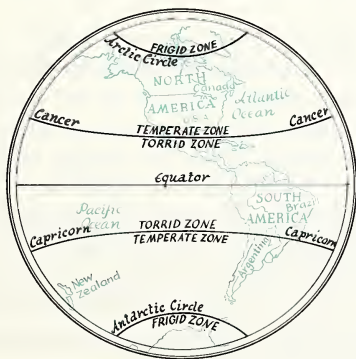
Each of the conclusions stated below was given in the selection.

1. *Author's conclusion:* "Most of the world's great nations have been located in the North Temperate Zone."

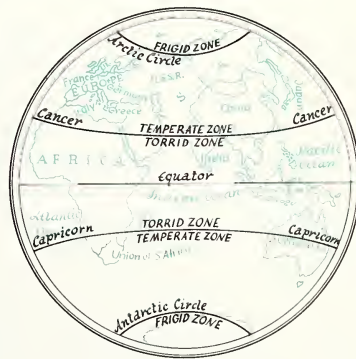
Testing his conclusion: List some great nations. Look at the maps. Find in what zone they are located. Decide if the author is right.

In What Zone?

Western Hemisphere



Eastern Hemisphere

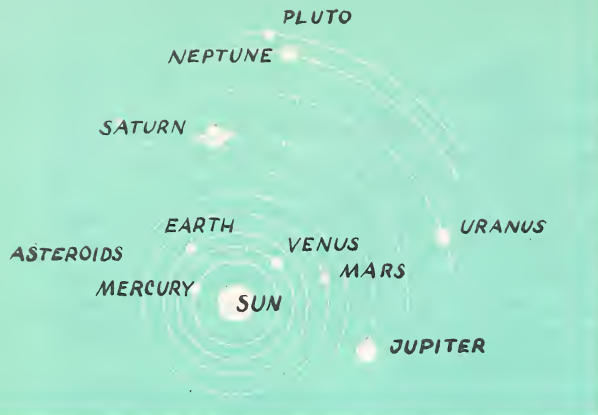


2. *Author's conclusion:* "People living in the temperate zones have more capacity for inventive ideas than those who live where it is either always cold or always hot."

Testing his conclusion: Suppose you doubt this

conclusion. If so you can test it by listing several great inventions and their inventors, and the place in which they lived when they made their inventions. Do this on a separate piece of paper. Decide if the author is right.

* Based upon material prepared by Wallace E. Lamb.



OUR NEIGHBORS IN SPACE

You have read a science fiction story about Mars, and something about the climate of Mars. There are several other planets in the skies. Why do we hear so much about Mars? The selection below will answer this question, and will also tell the place of Mars in the total solar system.

This selection is similar to another type of material which you find in your *science* books. It gives information which scientists have found out by observing the planets. It doesn't explain a process; it isn't a problem-solving, or classification selection. It just gives straight information. Science selections of this type are easier to read and can be read more rapidly than other types if you are reading just for the purpose of getting general information. If you wish to get detailed facts about some particular part, then you need to go back and reread that part more carefully.

Here is a procedure for you to use in reading this selection:

1. Read the entire selection through rapidly for

The sun together with the bodies that revolve around it is the *solar system* (sō'lēr sīs'tēm).

The whole mass of air which surrounds the earth is the *atmosphere* (ăt'mōs fēr).

general information. In reading a selection of this type for this purpose it is all right to try and read as fast as you can. Time yourself. When you have finished, do Activity 1 to find out how much general information you have gained in your first rapid reading of the selection.

2. Suppose that during this first rapid reading, you became especially interested in details about Mars. When you have finished with your rapid reading, go back to the two paragraphs about Mars. Underline the main idea in each paragraph, read the details carefully, then outline these paragraphs on a separate piece of paper. Use the form on page 58.

3. Suppose also that you would like to remember the order of the planets in their distance away from the sun. As a third step glance through the selection finding the phrases that name this order, and do Activity 2 on the next page.

A smaller planet that revolves around a larger planet is a *satellite* (săt'ē lit).

The path that is travelled by a planet is its *orbit* (ôr'bīt).

Beginning time: Hr. _____ Min. _____

THE PLACE OF MARS IN THE SOLAR SYSTEM *

Mars has been a subject of study for many years. Scientists have found out a great deal about its size, movement, and what it is made of. Mars is a sphere of rock, something like our earth. The diameter of the planet is only about 4,200 miles, roughly half that of the earth. The path which Mars travels around the sun is oval. About 687 of our days are needed for the planet to make the entire trip on this path.

The atmosphere of Mars has been of interest to scientists because they have thought that some kind of life might exist there. Careful examination with special instruments has shown that Mars has an atmosphere containing a small amount of oxygen and some water vapor. This planet goes through changes of season similar to those on the earth. Through the telescope we can see something that looks like ice caps

in the regions that are having winter. As spring and summer come, the ice seems to melt. Then, large blue-green patches appear on the reddish surface of Mars. These patches of green are thought to be some kind of simple plant life similar to our algae and mosses. There has never been any evidence, however, of any kind of animal or human life on Mars.

In addition to our own planet and Mars there are seven other planets travelling around the sun in huge orbits. The sun and this family of planets make up the solar system. The members of this family are our nearest neighbors in space.

The sun is a giant mass of burning gases over a million times larger than the earth. Although we are at an average distance of about 93 million miles from the sun, we depend upon this ball of fire for all of our heat, energy, and food.

Closest to the sun is the tiny planet Mercury. This

* Based upon material prepared for this book by Irving Zeichner.

is the smallest of the planets as well as the fastest. At a distance of only 36 million miles from the sun, the side of Mercury which faces the center of the solar system is very hot. Scientists believe the temperature to be over 700 degrees F.

The next planet in order, moving away from the sun, is Venus. Dense clouds cover the surface of Venus and reflect a great deal of sunlight. This is why Venus shines brighter in our evening sky than any other body in space except the moon. Telescopes cannot peer through these dense clouds, and so we know little about the surface of Venus.

The next planet in order of distance from the sun is the earth, our planet. Earth is the first planet to be circled by a little follower or satellite, the moon. The moon is a ball of rock about 2,000 miles wide and only about 240,000 miles away. The moon shines by light reflected from the sun. There is no air or water on the moon and, therefore, it would certainly be impossible for any life as we know it to exist there.

You have already read something about Mars, which is the next planet after ours in distance from the sun. Mars has two very small satellites, one of which circles the planet about three times each day.

Jupiter is fifth in order from the sun and the largest of all the planets. It is almost 90,000 miles in diameter and takes about 12 earth-years to complete its journey around the sun. Its atmosphere is made of poisonous gases which show as light and dark bands when seen through a telescope. Jupiter has 12 moons.

Saturn is next in order from the sun. Its average distance from the sun is over 800 million miles and, therefore, it receives very little heat.

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>
Ending time:	_____	_____	_____
Beginning time:	_____	_____	_____

Uranus and Neptune are next in order. These planets are two and three billion miles from the sun. Both planets are very large, but because they are so far away they cannot be seen without the help of a fine telescope.

Pluto, the last planet in order, was discovered in 1930. It is a small planet about which little is known because of its great distance from Earth. Some scientists now believe Pluto to be an escaped moon of Neptune rather than a real planet.

The problem of what keeps the planets in space revolving about the sun as they do has always been of interest to scientists. It has been shown that all things in the universe attract each other with an unexplained pull called *gravitation*. The larger the object is, the greater is its gravitational pull. Because the sun is so large, its force to attract the planets is very great. Fortunately, this force is not great enough to pull the planets into the sun, but it is just strong enough to keep the planets moving in their orbits.

Have you ever seen a boy flying a model airplane at the end of a steel wire? The airplane would like to fly off into space, but as long as the boy pulls on the wire the model continues to fly round and round in a circle until it runs out of fuel. The planets also would like to move straight out into space but the sun's gravitational pull balances their movement so that they continue to go around in vast orbits. Even though the sun burns up huge amounts of itself every second, its size is so great that its gravitational pull will keep the planets moving in their orbits for billions of years to come.

No. words	<u>930</u>	$\times 60 =$	_____ WPM
No. seconds	_____		

ACTIVITY 1—CHECKING INFORMATION INFORMATION

1. More information was given about one of the planets than the others. What was that planet? _____
2. Is there evidence of life on Mars? _____
3. The solar system is made up of the earth, eight other planets, and what else? _____
4. Which is larger, the sun or the earth? _____
5. Which is the smallest of the planets? _____
6. Which planet is covered with dense clouds? _____
7. What is the earth's little follower? _____
8. Why would it be impossible for life to exist on the moon? _____

9. Which planet is covered with poisonous gases? _____

10. What do some people think Pluto is? _____

Comprehension score: _____ WPM: _____

ACTIVITY 2—LISTING THE PLANETS IN ORDER

List the planets in the order of their distance from the sun, starting with the one nearest the sun:

- | | | |
|----------|----------|----------|
| 1. _____ | 2. _____ | 3. _____ |
| 4. _____ | 5. _____ | 6. _____ |
| 7. _____ | 8. _____ | 9. _____ |



DISTANCES AND SIZES

For many years people could do nothing more than gaze and wonder at the bright and twinkling bodies in the skies. No one had any idea how far away any of the bodies were or how large they were. As time passed by, scientific instruments were developed. New methods of computation were worked out. With the use of these instruments and methods of computation, astronomers can now estimate the distances of the sun, moon, and larger planets from the earth and from each other. They can also estimate the size of these different bodies.

You may work with some problems that make use of the figures which astronomers have given us. These problems will furnish you much valuable information. They will also help you better to appreciate sizes and distances as you read and hear more about trips in space ships.

In working with each of these problems do the following things:

1. Read the entire problem carefully enough to get its meaning as a whole.

2. Reread parts of the problem to get the particular information needed to fill the blank spaces under the headings in the chart. Write that information under each heading as soon as you have decided upon it. After you have completed the chart, you will be given an opportunity to complete the problems.

PROBLEMS ABOUT THE SUN, MOON, AND STARS

1. The moon is 240,000 miles from the earth. Mars is 48,000,000 miles from the earth. How many miles farther away is Mars than the moon?
2. The earth is 7,918 miles in diameter, and Mars is 4,216 miles in diameter. How much greater is the diameter of the earth than that of Mars?
3. It takes Mars 687 days to make one revolution around the sun. How many months of 30 days each would this be?
4. Neptune is 2,793,000,000 miles from the sun, and Mars is 141,000,000 from the sun. Neptune is how much farther from the sun than Mars?
5. Mars is 48,000,000 miles from the earth. Suppose that a jet plane could fly 740 miles per hour. How many miles could it fly in a 24-hour day? How many days would it take the plane to reach Mars?
6. The earth whirls around the sun at the rate of 72,000 miles per hour. How many miles does it travel around the sun in a 24-hour day?
7. Jupiter has a diameter of 88,700 miles, while the earth's diameter is 7,918 miles. How many times greater is Jupiter's diameter than the earth's diameter?
8. Colonel Dixon weighed 172 pounds on earth. He only weighed 38 per cent of this number of pounds on Mars. How many pounds did he weigh on Mars?
9. From a great disk-shaped group of stars light has been traveling toward us for about 900,000 years at a speed of 186,000 miles per second. How many miles does this light travel in a minute (60 seconds)? How many miles in an hour (60 minutes)?
10. Suppose that on a clear night you were able to see with your naked eyes about 1,865 stars in the sky. It is possible to see about 5,000 stars with the naked eye in a year. What per cent did you see of all the stars that it is possible to see?

Problem No.	Asks You to Find	Facts Given	Process to Use	Estimate of Answer
1				

<i>Problem No.</i>	<i>Asks You to Find</i>	<i>Facts Given</i>	<i>Process to Use</i>	<i>Estimate of Answer</i>
2				
3				
4				
5				
6				
7				
8				
9				
10				

Compute the ten problems with which you have been working, making use of the information which you have written in the chart. With all of this information at hand, you should be able to do your computations very quickly. Use separate paper.

Applying What You Have Learned About Reading Problems

You have learned that you need to spend a lot of time reading and thinking about a problem before you compute it. You have learned how to use a chart which gives you the needed information before you try to compute a problem.

When you are about to tackle a new set of problems in a *mathematics* book, make a chart like the

one above. Then read and reread each problem to find information to place under each of the headings. Once you have gotten all of this information before you, it won't take long to compute the problems. And when you do compute them the answers will probably be correct! All kinds of mathematics require careful reading.

PREFIXES, SUFFIXES, AND ROOTS

Working with Prefixes

Some new prefixes are:

in—into, not
circum—around
ex—out of, from

Write the correct prefix before each of the words below:

1. _____ port: to send out of the port
2. _____ press: to send out, away
3. _____ navigate: to sail around
4. _____ debtedness: state of being in debt
5. _____ scribe: to draw a line around
6. _____ ability: state of not having ability

Working with Suffixes

Some new suffixes are:

al—pertaining to
ward—turning to, direction of
able—given to, tending toward

Write the correct suffix at the end of each of the words or parts of words below.

1. fraction _____ : pertaining to fractions
2. west _____ : toward the west
3. home _____ : toward home
4. intention _____ : pertaining to an intention
5. change _____ : given to change
6. peace _____ : tending toward peace

Combining Roots

Here are the meanings of some words and roots which are combined to make long words you often hear. Study the meanings of these words and roots.

<i>Root or Word</i>	<i>Derived from</i>	<i>Meaning</i>	<i>Where Often Used</i>
tele	a Greek word	far, at a distance	first part of a word
scope	a Greek word	view, viewer	last part of word
phone	a Greek word	sound, sounder	last part of word
graph	a Greek word	to write, writer	last part of word
typewriter	<i>Type</i> comes from a Greek word meaning "symbol." <i>Write</i> comes from the Anglo-Saxon <i>writan</i> meaning "to scratch or underscore."	a machine that writes type	last part of word

Combine the root tele with each of the other roots in the list above to make a word. Tell the meaning of each of these new words, as derived from the meaning of each of its parts.

New Words

Meaning

DIVIDING WORDS OF SEVERAL SYLLABLES

You know several different guides to use in dividing words into syllables. Much of the work with syllables which you have had so far in this book has been with two-syllable words. Most of the new words which you will meet will have three or four syllables, sometimes five or six syllables in them. These words will be easy to pronounce if you first divide each one into syllables, and then work out the sound of the vowel and the consonants in each syllable.

In working with words of several syllables, you use the same methods of deciding where to divide between syllables that you used in working with two-syllable words. The only difference is that you may use two or three of the different guides that you have learned.

In dividing the word *communication* for example, you use three of the different guides you have learned. Perhaps you would proceed like this:

1. Divide between double consonants, thus: com munication.

2. Knowing that when one consonant comes between two vowels you usually divide before the con-

sonant, you will make the next division as follows: com mu nica tion. Similarly you will divide before the consonant c and the consonant t for the same reason: com mu ni ca tion.

3. You know that ion is a suffix and that a suffix sometimes takes a letter from the root word. So you let the division stand before tion and the rest of the word. Your final division of the word stands as follows: com mu ni ca tion.

The example above shows that you sometimes need to apply several of the different guides that you have learned in dividing one of these longer words.

See if you can divide all of the words below correctly. Use any or all of these guides as they apply:

1. Divide between words forming compounds.
2. Divide between double consonants.
3. Divide between separately sounded consonants.
4. Divide before single consonants between sounded vowels.
5. Consider blends and speech sounds as single consonants. (Treat le, dle, and similar formations as syllables.)
6. Divide between root words, prefixes, suffixes.

suddenly

paragraph

represent

mentally

estimate

horizon

procedure

consonant

relation

expansion

tradition

successful

vertical

conclusion

formula

telephone

invention

practical

battery

instrument

releasing

descendant

meaningful

direction

difficult

fractional

important

invocation

pictograph

telegraph

instructions

measurement

settlement

company

probably

syllable

adventure

permission

establish

possible

industry

arrangement

Ottawa

tobacco

continent

ancestor

conflicting

commonly

information

Saskatchewan

indebtedness

recumbent

Victoria

combination

operator

horizontal

transportation

approximate

recovery

teletypewriter

resentment

gigantic

thermometer

democracy

representative

opportunity

immediately

electromagnet

WORKING WITH ACCENT MARKS

As you know, an accent mark looks like this: '. When an accent mark is placed after a syllable, it means that we stress or emphasize that syllable more than an unaccented syllable when we speak.

won der	free dom
hid den	pro tect
dis cuss	shel ter
shov el	un load
sup per	hap pen
sci en tist	sev er al
Sat ur day	sud den ly
cus tom er	de scrib ing
tel e phone	pro fes sor
A mer i can	in form
oc cu py	pro pose

Here are some words that you know. Pronounce each of the words, stressing one of the syllables. Then place the accent mark after the stressed syllable in each one of them.

kitch en	doz en
fin ger	re port
dan ger	sur prise
pa per	of fice
ho tel	com mand
a muse ment	gov ern ment
sim i lar	con clu sion
gos sip	ar ti cle
pos si ble	dif fi cult
op er ate	ex pe ri ence
in hab it ant	re mark a ble

Sometimes it is fun to place an accent mark after different syllables in a word and see how this changes the pronunciation of the word. If we place the accent mark after the first syllable in blan'ket we pronounce the word as we usually do. If we place the

accent mark after the second syllable (blan ket') then we stress the ket and pronounce the word quite differently.

Try pronouncing these words in different ways according to where the accent mark is placed:

ex press'	num'ber
ex'press	num ber'
mag'net	trav'el
mag net'	trav el'
syl'la ble	di'rect ly
syl la'ble	di rect'ly
syl la ble'	di rect ly'
con'tin ue	set'tle ment
con tin'ue	set tle'ment
con tin ue'	set tle ment'

rid'er	let'ter
rid er'	let ter'
budg'et	cir'cle
budg et'	cir cle'
par'a graph	im'por tant
par a'graph	im por'tant
par a graph'	im por tant'
Oc'to ber	Pa'cif ic
Oc to'ber	Pa cif'ic
Oc to ber'	Pa cif ic'

Some words really have the accent in a different place when they are used in different ways.

When *combine* is used as a verb, the accent comes on the second syllable: Mrs. Shafer said, "I shall com bine' the flour and sugar first."

When combine is used as a noun, the accent comes

on the first syllable, as: The farmer cut his wheat with a com bine.

The same words are used in different ways in the sentences below. See if you can place the accent mark after the right syllable in the italicized word in each of the sentences.

1. It was a *per fect* day.
2. Mr. Brown wants to *per fect* his invention.
3. Mr. Steel wanted to *in crease* the number of chickens in his flock.

4. Mr. Johnson received an *in crease* in salary.
5. Mrs. Mack had an *ex pert* refinish her furniture.
6. Mr. Arden was very *ex pert* in his work of repairing watches.

Applying What You Have Learned

When you look up a word in a glossary or dictionary, be sure to take note of the accent mark. When a word is accented in two different ways, be sure to select the pronunciation that goes with the meaning of the word as it is used in the sentence.

WORKING WITH SOCIAL STUDIES WORDS

The words below are used frequently in *social studies* and *history* textbooks at your school level. If you know the pronunciation and meaning of these words, it will be helpful to you in studying these books. Even if you think you know many of these words, do the work just the same. You may find that you don't know the pronunciation or meaning of some of them as used in *social studies*.

Work out the pronunciation of each of these words. Say the word distinctly. Next study the meaning of the word and think about it.

induction in duk'shən	To introduce into an office with suitable ceremonies; reasoning from particular facts to a general rule or principle; a process by which an object having electrical or magnetic properties produces similar properties in a nearby object without direct contact.
judicial jōō dīsh'āl	Having to do with courts of law. The judicial branch of our government includes the Supreme Court and all other courts in the country.
legislation lēj'is lā'shūn	The making or enactment of laws by any person or body of persons having power to do so.
missionary mīsh'ūn ěr'ī	Usually one who goes or is sent to a country to spread religion.
monopoly mō nōp'ō lī	The exclusive right or power to produce, sell, or purchase goods in a certain market.
neutrality nū trāl'ī tī	The condition of being uninvolved in disputes.
nullification nūl'ī fī kā'shūn	Act of destroying a law, depriving of legal force and validity.
propaganda prōp'ā gān'dā	Ideas, information, or gossip spread for the purpose of injuring or aiding a person, institution, or cause.
ratify rāt'ī fī	To formally approve, as a treaty by a legislature.
rebellion ré bēl'yūn	A stand taken against the government to which one owes obedience.
referendum rēf'ēr ěn'dūm	Placing a proposed law which has been passed by legislation before the people to vote on it.
reparation rēp'ā rā'shūn	In <i>history</i> , usually a sum paid by one country to another for damage to property.
suffrage sūf'rīj	The right to vote in political matters.
tariff tar'if	A duty or tax on imports or exports; any table or scale of prices.

See if you know the meaning of each of the words as it is used in *social studies*. Choose one of the words to write in each of the blank spaces below.

- The _____ of provincial laws takes place in the provincial capital.
- A printed booklet was passed from door to door containing _____ which was supposed to injure one of the candidates.
- King George tried to put down the _____ of the Colonists against Great Britain.
- The government announced a new _____ on coffee coming into the country.
- When a legislature approves a treaty, it is said to _____ the treaty.
- Even if the legislature has passed a law, it can be killed by the people through _____.
- Sometimes a law is destroyed entirely. This is called _____.
- If one company tried to get exclusive rights to the manufacture and sale of all shoes in this country, that company would want a _____ on shoes.
- India will not take sides on many of the world problems. It is a country of _____.
- A foreign country shot down a Canadian airplane. She made _____ to Canada for the damage.
- For many years women were not allowed to vote, but now they have _____.
- All of our courts belong to the _____ branch of our government.
- When our new club president took office he made a fine _____ speech.
- One church in Toronto sent a _____ to a faraway island to teach the natives religion.

SCANNING FOR NUMBERS

Sometimes you wish to read a part of a selection or chapter just for the purpose of finding and remembering the numbers which are given about a topic. You may wish to find numbers about a topic quickly when you are searching for information to make a report, when you are reviewing for a test, or when you want to look up some figures as a matter of personal interest.

When you are searching for figures alone, you do not need to read every word in the paragraphs that have to do with figures. Scan for the figures, only.

This is how to scan:

1. Sweep your eyes down through the middle of the paragraphs, not stopping to read any words at all.
2. When you catch a glimpse of a number, pause long enough to read the three, four, or five words on either side of the number which give meaning to the number.
3. Think about the number and its meaning and try to fix both the number and its meaning in your mind.
4. Sweep your eyes over the lines of print until

they catch sight of another number. Then do the same things that you did in 2 and 3 above.

5. As you pass from one number to another, think about the bearing which each new number has upon the number before it. Compare the numbers and estimate the difference between them. This will help you to remember them.

6. In most cases try to remember only round numbers. If you read that an airplane carried 9,623 letters per trip, and want to remember the number, just think of it as 9,600.

Of course you need to remember dates exactly. There may be times when you will wish to remember other numbers exactly, but in most cases round numbers will serve your reading purpose.

Scan each of the selections below for the purpose of finding numbers only and fixing them in your mind. Follow the directions given above for scanning.

When you have finished scanning the selection on Banff National Park, answer the questions beneath the selection. Continue to work with the selection on Riding Mountain Park in the same way.

Banff National Park

Banff National Park, founded in 1885, is the oldest of Canada's 22 national parks. It lies in the Rocky Mountains about 70 miles west of Calgary and covers an area of 2,564 square miles.

The park is famous for the splendor of its beautiful forests, glittering lakes, magnificent waterfalls, and lofty mountains. The highest peak is that of Mt. Assiniboine, which rises 11,870 feet above sea level and is often called the "Matterhorn of the Rockies." Banff, however, is also famous for its hot springs, which are said to contain minerals very beneficial to health, and which issue from the ground all the year round with a temperature of over 90 degrees F. The total flow of the springs is about 40,000 gallons per hour, and the yearly outflow is in the neighborhood of 2,000,000 tons.

1. How many national parks has Canada? _____
2. How far from Calgary is Banff Park? _____
3. About how many square miles are there in the park? _____
4. How high is Mt. Assiniboine? _____
5. What is the temperature of the springs? _____
6. How much water flows out per year? _____

Riding Mountain Park

Riding Mountain is one of our most popular national parks. It is in Manitoba about 150 miles northwest of Winnipeg and about 175 miles northeast of Regina. It contains about 1,184 square miles.

The park lies on a plateau which rises 1,100 feet above the surrounding plain. Riding Mountain is an area of great scenic beauty, but is particularly famous for its wild animals, which include bears, moose, and about 3,000 elk. A large herd of bison roam in an enclosure 2,000 acres in extent.

The park is also a center for sports, including golf, fishing, tennis, riding, swimming, and boating on the 9 miles of Clear Lake.

1. How far is Riding Mountain from Winnipeg? _____
2. How far from Regina? _____
3. About how many square miles are there in the park? _____
4. How high above the plain is the plateau? _____
5. How many elk are in the park? _____
6. How long is Clear Lake? _____

ORGANIZING SENTENCES INTO PARAGRAPHS

Below you will find several facts about Ontario. Although not one of the first settled, Ontario has now the largest population of any of the provinces. These facts will help you to understand why this province has become wealthy, and why there are so many different types of work for its people.

The sentences are not organized into paragraphs. That is for you to do. If you do some organizing of

sentences into paragraphs, yourself, you will find it easier to read paragraphs which other people have written.

The topic of each of the four paragraphs is given in one of the boxes below. There are several sentences that belong to each topic. Number each sentence with the number of the topic to which it belongs. The first one is done for you.

Ontario

1. Surface	2. Farming	3. Mining	4. Manufacturing
1. ——— Ontario, the second largest of Canada's provinces, can be roughly divided into two regions. 2. ——— The eastern lowlands along the St. Lawrence are noted for their dairy products. 3. ——— The province produces, however, very little coal. 4. ——— Among these products are agricultural machinery, leather, canned meat, flour, and cheese. 5. ——— The chief farming areas of Ontario lie in the south. 6. ——— Ontario produces one-third of the value of all the mineral output of Canada. 7. ——— The southern region is bounded by Lakes Huron, Erie, Ontario, and Nipissing. 8. ——— Here, too, large cities such as Toronto, Hamilton, Windsor, and Ottawa provide a ready market for agricultural produce. 9. ——— Here is mined nearly all of Canada's nickel, platinum, and cobalt. 10. ——— An abundance of raw materials, close markets, and easy transport contribute to making manufacturing the largest industry of Ontario. 11. ——— Among the forests are scattered thousands of lakes and rivers. 12. ——— Elsewhere are grown peas, beans, corn, sugar beets, peaches, apples, and grapes.			13. ——— The chief industrial area lies at the western end of Lake Ontario. 14. ——— To the north of Lake Nipissing, however, lie wild areas of rocky and forested country. 15. ——— Minerals are produced chiefly in the north of the province around centers such as Sudbury, Kirkland Lake, Timmins, and Cobalt. 16. ——— Here the summers are longest and the winters least severe. 17. ——— Most of this area is low and fertile. 18. ——— Quite a number of Ontario's other manufactured products are connected with the agricultural industry. 19. ——— However, this lack of coal is compensated for by cheap hydro-electric power drawn from plants such as that at Niagara Falls. 20. ——— Much of this produce is sent to canning factories. 21. ——— Paper, steel, and automobiles take the lead among manufactured products. 22. ——— This mineral, therefore, has to be imported from the United States. 23. ——— Also important are rubber and electrical goods, aircraft, clothing, chemicals, and furniture. 24. ——— In fact, one-fifth of the province is covered by water.

Now take a piece of paper and see if you can arrange these sentences into paragraphs.

Reread all of the sentences which you numbered 1. Find the sentence which you think gives the main idea of the paragraph, and write that. Next reread the other sentences which give details about this main idea. Write them in the right order to make the entire paragraph.

In the same way, write the sentences for each of the other topics in paragraph form.

UNIT SIX

WELDING A DOMINION



You have heard about the first transcontinental railway that was built across the west in early days. The men who supervised the building of this railway were as strong in their leadership as the steel rails with which they worked. You will read about one of these men in the story below.

Read the story as fast as you can and still enjoy it.

A person who copies or writes notes over again is said to be *transcribing* (trăn skrib'ing) them.

A *trestle* (tres'al) is the strong open framework which supports the rails on a railway bridge.

When a person cannot be disheartened or frightened, it is said that nothing *daunted* (dont'əd) him.

Craigellachie (kräg ə lăch'ē) is a town on the main

line of the Canadian Pacific Railway, 28 miles west of Revelstoke.

A *fossil* (fos'al) is the actual remains of a living thing kept in the rocks, or evidence, such as an impression in the rocks, that the object was once there.

A brief written message containing things to be remembered is a *memorandum* (mem'ə ran'dəm).

Beginning time: Hr. ____ Min. ____

A MAN OF STEEL

William Van Horne was hired by the Canadian Pacific Railway Company in 1881 to lay twenty-nine hundred miles of steel track from northern Ontario to the Pacific Coast. Businessmen said the job couldn't be done, but Van Horne said that he would do the impossible. Who was this man? What qualities did he have which made him a leader?

He was born in 1843 in Illinois, but after working on the railway he became a Canadian citizen. "To have built that road," he said, "would have made a Canadian out of the German Emperor."

Intelligence and hard work were inseparable twins to him. He was recommended to head the construction job because the men of the Railway Company considered him to be the best equipped mentally. Van Horne himself told of being so interested in geology as a young man that he copied a 262-page volume on the subject by longhand into five nickel scribblers. He said later that transcribing the book taught him how much he could accomplish by hard work.

He had an amazing zest for living. The days were never long enough to permit him to carry out the many projects he had planned. "When I think of all I could do," he said as he lay dying, "I should like to live five hundred years."

Van Horne could not be kept within the four walls of an office. He travelled constantly along the places

where railway construction was proceeding. On many occasions when the railway workers hesitated to go ahead with a dangerous job, he would join the men and work with them. Work was held up in the Rockies once when an engineer refused to drive his locomotive over a swaying trestle. Van Horne climbed into the cab himself. "Well, if you ain't afraid of getting killed, with all your money, I ain't afraid either," figured the astonished engineer. "We'll have a double funeral—at my expense, of course!" Van Horne bellowed back across the wobbling cab. They reached the other side safely.

No task daunted him. He surveyed the northern shore of Lake Superior to find the best route for the railway. Upon his return he commented, "It's two hundred miles of engineering impossibility, but we'll bridge it." And he did!

Although he was constantly learning new things, he never forgot an old skill. He kept a Morse Code Key for practice in his private railway car. Once he heard a message coming in for him at a telegraph office. The clerk handed him the message and Van Horne gave him back the reply immediately. With one hand on the key he had received the dots and dashes while writing his answer with the other.

Even while he pushed to completion big projects like the building of the first transcontinental railway,

he found time for many wonderful hobbies. As a young boy he hunted for fossils in the cliffs around his home. He found a perfect specimen in a stone slab on the main street of the town too, so he returned at night and chipped it out. During his lifetime he discovered and classified many new specimens, ten of which are named after him. Other hobbies included collecting Japanese pottery and the raising of mushrooms.

A leader among men, he would not allow any employee of the railway to be content with second place. He once sent out a memorandum that any Canadian Pacific Railway engineer caught in a race with a competing railway would be fired at once. Then he added a footnote to the order that any Canadian Pacific Railway engineer who allowed the competing railway to

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>
Ending time:	_____	_____	_____
Beginning time:	_____	_____	_____

COMPREHENSION QUESTIONS

- Where was Van Horne born? _____
- How old was Van Horne when he was hired by the Canadian Pacific Railway Company? _____
- Name three of Van Horne's hobbies.

- Why did he chip one fossil out of the stone during the night? _____

- What event in Van Horne's youth taught him the value of hard work? _____

- Name five qualities Van Horne had which helped to make him a leader.

beat him would be in danger of instant dismissal from his job.

Shortly after the completion of the railway, Van Horne bet a group of newspaper men he could take them by train the distance from Winnipeg to the Rocky foothills between dawn and dusk. He won the bet, but to ensure success he made the trip on June 21st, the longest day of the year.

This is a brief description of the man who on November 7th, 1885, at Craigellachie, British Columbia, stood on the right hand of Lord Strathcona while he hammered in the last spike of the railway. Behind him was a ribbon of steel across the Dominion of Canada. He had supervised the building of one of the world's largest transportation systems. The task men had said was impossible he had helped to make possible.

No. words $\frac{746}{\text{No. seconds}} \times 60 = \text{WPM}$

- What bet did Van Horne make with newspapermen?

- How did he help to ensure the successful winning of the bet? _____

- What does welding mean in the title of the Unit? _____

- What did Van Horne think about competition? _____

DISCUSSION QUESTIONS

Write your answers on a separate piece of paper.

- Give three reasons why the businessmen believed that a railway could not be built across Canada.
- Why did Van Horne become a Canadian citizen?
- Does the title, "A Man of Steel," describe Van Horne well? Support your answer.
- Write two sentences describing Van Horne's attitude toward life.
- Give reasons why you think that most of the workers would appreciate Van Horne's leadership.
- In your opinion is it important for a leader to have a hobby? Why?
- Do you think it was appropriate that Van Horne stood on Lord Strathcona's right when the last spike was driven in the rail? Why?
- Why is "Welding a Dominion" an apt title for this unit, as judged from this one story?

LINKING WEST WITH EAST



Study this picture carefully. Then write a short paragraph describing the Canadian Pacific Railway using all of the information that you can gather by *reading* the picture. Include *all* that you can read directly from the picture, but don't include anything that you can't read from the picture.

A beginning sentence for the paragraph might be: "The railway route through the mountains extended from Calgary, Alberta, to Port Moody, British Columbia."

Write your paragraph on a separate piece of paper.

When a number of smaller parts make up a larger thing, it is *comprised* (kəm prɪz'd) of them.

When we change or alter other people's plans by persuasion or advice we *dissuade* (dɪ swād') them.

Any exchange of information and ideas by words, letters, or messages is called *communication* (kə mū' nə kă'shən).

When something is left complete or uninjured, we say that it is *intact* (ɪn takt').

A thing is *traversed* (trav'ərsd) when it is crossed or passed over by something else.

Devil's club is a spiny shrub with large lobed leaves and clusters of flowers.

The end of the railway or its farthestmost station is called the *terminus* (tər'mə nəs).

Below you will find a selection on the "History of the First Transcontinental Railway." This selection has several numbers in it. It will be a good one for you to use in getting more practice in the skill of scanning.

1. Suppose that you are interested only in finding out the *dates* of important events which happened just before, during, and immediately after the building of the railway. Try to glance straight down through the middle of the page quickly, pausing only when you catch sight of a date. When you do see a date, stop long enough to find what event took place on that date, and try to impress both the date and the event on your mind. Then scan down the page until you catch a glimpse of another date. Find out the event that took place on that date, and try to think of the second date in relation to the first one,

perhaps mentally estimating how many years elapsed between the two. Continue on in this way scanning for, and thinking about, the dates in the selection until the entire selection has been covered.

When you have finished scanning the selection for dates, carry out Activity 1.

2. Next scan for numbers having to do with *mileage* and for the information that each number represents. Then do Activity 2 on the following page.

3. Similarly scan for numbers and brief information having to do with the *business* of the railway. Then do Activity 3 on the following page.

4. After finishing with your scanning, read the first three paragraphs of the selection carefully. You will be asked some reasoning questions about statements made in these paragraphs.

HISTORY OF THE FIRST TRANSCONTINENTAL RAILWAY

Of the six provinces which comprised the Dominion of Canada in 1871, British Columbia was the only one almost completely isolated from the others. Between Manitoba, Ontario, Quebec, Nova Scotia, and New Brunswick and this far western province lay 2,000 miles of almost unsettled country. To dissuade British Columbia from joining with the United States, Sir John A. Macdonald, Canada's first Prime Minister, had promised in 1870 that a railway linking the west with the east would be built within 10 years.

Before Confederation, few had travelled across the country. Some had ventured overland, but most of

the fur traders and explorers had chosen to travel by canoes, allowing these crafts to carve the paths for them through the forests, swamps, and mighty mountain ranges. Now, if the provinces were to weld themselves together into one Dominion of Canada, a sure, safe, and convenient way of travel and communication had to be found for settlers and government workers. A railway seemed to be the answer.

The project began under the direction of the government; in 1880, however, the Prime Minister announced that a group of men who had formed the Canadian Pacific Railway agreed to build and operate

the railway from Callander near Lake Nipissing in Northern Ontario to Port Moody in British Columbia. In charge of the company's finances were George Stephen (later Lord Mount Stephen) and Donald A. Smith (later Lord Strathcona). William Van Horne was the efficient, tireless manager. He began to build in 1882 in three places: from Northern Ontario to Winnipeg, from Winnipeg to the Rocky Mountains, and from the Pacific Coast eastwards.

The route chosen began near the present city of Callander and proceeded through the rock and muskeg wilderness north of Lake Superior. So hard were the rocks along the lake shore that Van Horne built an emergency dynamite factory and blasted the road through at the approximate cost of \$500,000 a mile. His men used \$2,000,000 worth of dynamite alone in this stretch of land. The muskeg was as treacherous as the rock was hard. Rails laid in muskeg would sink and disappear over night, and at one spot seven layers of rails were buried one below the other and three locomotives were sucked in. To accommodate the rails one lake was lowered 10 feet.

From Winnipeg to the Rockies, the 1,000 miles of prairie land presented quite a different problem. The flat, unguarded, lonely stretch of land made it difficult to move supplies to the working areas and to keep those supplies intact for the workers.

Separating the prairies from the coastal area were 500 miles traversed by three parallel mountain ranges, the Rocky Mountains, the Selkirk Range, and the Gold Range. Surveyors and engineers found and used

three passes: Kicking Horse Pass through the Rockies, Rogers Pass through the Selkirks, and Eagle Pass through the Gold Range nearer the Pacific Coast. Here the workers built bridges over raging torrents, hewed tunnels through mountains, and widened and levelled narrow paths on the sides of precipices. They had to fight shifting gravel, snow avalanches, difficult grades, and acres of poisonous devil's club. The drip of the huge forest trees drenched them.

The first terminus selected was Port Moody, but the harbour was found to be too shallow for ocean vessels so Van Horne walked to a clearing on Burrard Inlet and said, "This will be our terminus, and we'll call it Vancouver."

Although the Canadian Pacific Railway Company was given 10 years to complete the railway line, they accomplished the task in 5 years with through traffic beginning in the sixth year. On November 7th, 1885, the last spike was driven in at the tiny railway station of Craigellachie, British Columbia, a name which is Gaelic for "Stand Fast." Surrounded by Van Horne, Stephen, and the railway workers, Lord Strathcona drove in the spike. He commented, "This spike is not silver or gold, but it is as good a spike as you can find between Montreal and Vancouver and no better."

The ceremony finished, Strathcona, Stephen, and Van Horne boarded their west-bound train again and continued their journey to Port Moody. This first transcontinental train had left Montreal October 27th, 1885, and arrived in Port Moody November 8th.

ACTIVITY 1—DATES AND EVENTS

Write the dates and the events that happened on these dates as you gathered them by scanning.

	Events	Year	Month
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

ACTIVITIES 2 AND 3—MILEAGE AND BUSINESS NUMBERS

On a separate piece of paper list the mileage numbers and information that you were asked for in the instructions on page 76. Then do the same for the business numbers and information.

ACTIVITY 4—REASONS

- The article stated that a safe and convenient way of travel and communication had to be found between British Columbia and the eastern provinces. What reasons can you give in support or rejection of this statement?

- William Van Horne was described as an efficient manager who began to build the railway in three places. Do you think this method could be efficient? Give reasons for your opinion. _____

You have just read how the railroad was built to link the east and the west of Canada. Today it still takes three days to go by rail from Montreal to Vancouver. Little did the railway workers dream that within forty years people would be talking to each other across the continent. Today a person in Vancouver can speak over the telephone to someone in Montreal within minutes.

You have read how the telegraph works. Now you may find out how the telephone works.

What type of *science* material do you think you will have to read in this selection: Problem-Solving? Classification? Straight information? Explaining a process? Having decided what type it is, how are you going to read it?

See if your own thinking agrees with the instructions.

1. No doubt you decided rightly that this selection which you are about to read explains a process. Like many other selections of this type the first paragraph gives you interesting background information which you should read as you would a story.

2. After the first paragraph the rest of the selection has to do with processes. Read this selection as you have read other selections dealing with processes.

Read each sentence carefully, and after reading it look at the diagram to get a clearer meaning of the sentence. When you have finished reading about each one of the processes as a whole, see if you can repeat the steps in the process to yourself.

A person or thing that sends something to another place is called a *transmitter* (trăns mî'tēr).

Quivering or trembling motions are called *vibrations* (vî bră'shûnz).

A vibrating partition is called a *diaphragm* (dî'á frăm).

A tiny grain of a substance is sometimes called a *granule* (grăn'ül).

A core of soft iron surrounded by a coil of wire through which an electric current is passed to magnetize the core is called an *electromagnet* (ê lèk'trô mǎg'nèt).

A particle having a single charge of negative electricity is called an *electron* (ê lèk'trôn).

A particle having a single charge of positive electricity is called a *proton* (prô'tôn).

HOW THE TELEPHONE WORKS

The telephone has two parts, each of which has its own job to do. The transmitter is the part into which you speak when calling someone by phone. The receiver is the part which you place to your ear while receiving the words that someone else is speaking.

The first thing that you need to know in understanding how a transmitter works is that when you speak your voice sets up waves in the air. When you speak into the transmitter these waves strike against a lightweight cone of metal called the *diaphragm*. This diaphragm is the top of a box holding tiny grains of carbon. When these grains are pressed together, more electricity can pass through them.

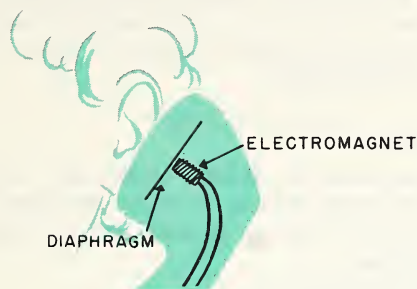
Your voice controls a flow of electricity through the carbon granules. As you speak, your voice sends out strong and weak vibrations. The diaphragm catches these vibrations and sends them on into the box of carbon granules. The grains of carbon become more closely or less closely packed, accordingly. And

in turn, more or less electricity passes through them. Several changes may take place in the carbon granules as you say each word.

The electric current carries all of these changes over the wire. Now it remains for the receiver at the other end of the line to change these strong and weak electric currents back into sound waves like those made by your voice.



The receiver also has two important parts, another metal diaphragm and an electromagnet. An electromagnet is a rod surrounded by a coil of wire; when electricity passes through the wire, the rod attracts metals toward it. This electromagnet receives the current set up by the transmitter.



The strength of the current in the electromagnets becomes strong or weak in exactly the same way that it became strong or weak as the vibrations of your voice acted on the carbon granules.

As the electromagnet becomes stronger it pulls in the center of the diaphragm. As it becomes weaker, the diaphragm begins to go back to its original shape.

These changes in the diaphragm set up sound waves in the air. These sound waves travel to your ear. Since they vibrate at the same rate as the sound waves made by the voice of the person speaking to you, you hear that person's voice and words.

You have learned how the transmitter and the re-

ceiver work. Next you need to find out how the vibrations are carried by electricity through wires.

Before explaining what makes electricity move, you need to understand just what electricity is.

You know that all materials are made up of molecules, and that molecules are made up of atoms. Atoms in turn are made up of two kinds of electricity—positive electricity and negative electricity. The negative particles are called *electrons*. These electrons move easily.

The positive particles are called *protons*. These protons are nearly 2000 times as heavy as electrons. They do not move easily. Atoms usually have an equal number of electrons and protons.

An electric battery, or generator, destroys the balance of electrons and protons in atoms by concentrating electrons at one of its poles, protons at the other. When the poles are connected, as by a copper wire, the extra electrons at one pole flow toward the extra protons at the other, in order to restore the balance. The flow is called an *electric current*. A balance never is restored while the battery, or generator, is working, of course, because the action of the battery, or generator, continues to move electrons away from the protons as fast as the electrons arrive. This continuing flow is called a *circuit*.

When you pick up the receiver of your phone, then, you complete an electric circuit. Electrons begin to flow through the wire. As they flow, they carry the vibrations of your voice with them.

ACTIVITY 1—LISTING STEPS IN A PROCESS

You will need plenty of space in doing A, B, and C, so do your work on a large sheet of paper.

A. List in order the steps that take place from the time you begin to talk in the transmitter until the wires pick up the vibrations of your voice. Number the steps.

B. List in order the steps that take place from the time the current reaches the receiver until the person to whom you are talking hears your voice in his ear.

C. Explain in your own words what causes an electric current to flow. Try to do this in one paragraph.

ACTIVITY 2—MAKING A DIAGRAM

On a separate piece of paper draw a diagram to show what happens when you make a telephone call. Show a part of a face with the mouth talking into the transmitter on one side of the page, and a part of a head with an ear near the receiver on the other side.

Label the parts of the transmitter and receiver which you read about in the article. Draw a line showing the route your voice travels from the time you speak until the one to whom you are phoning hears you at the other end of the wire.

Applying What You Have Learned About Reading Science Material

When you begin to read a new section in a *science* book, glance over it to find out what type of material you will have to work with. If the material gives an explanation of how something works, make up your mind to do slow, careful reading. Read and think about one sentence at a time, and look often at the diagrams. When you have finished the explanation

of one part of the process, try to give the explanation to yourself, then go on with the next part.

Listing the steps and drawing a diagram of your own are very helpful ways of getting a clearer grasp of a total process. Once you get a clear and vivid understanding of the process, you will be able to remember it.

READING GRAPHS

Graphs are often used to compare numbers or to tell a story about some subject in which numbers are important. Newspapers and magazines make much use of graphs. *Social studies* books, *science* books, and *mathematics* books usually have graphs in them. These graphs enable you to compare numbers or to grasp a number story much more quickly than would

be possible if you had to read the same information written in a paragraph.

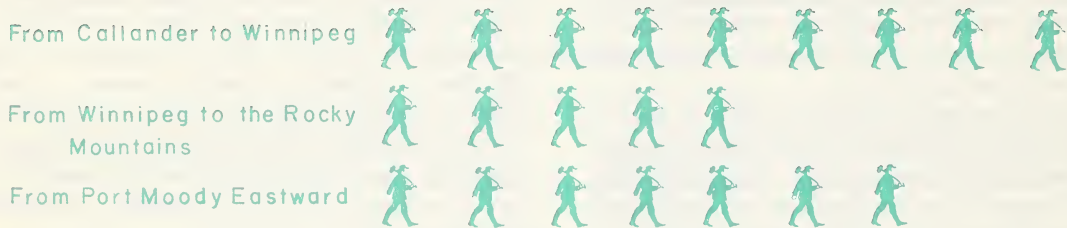
There are some graphs on these three pages which have to do with the First Transcontinental Railway. These graphs will add to your understanding of this subject. Practice in reading them should improve your graph-reading skills.

Pictograph Showing Comparisons

A pictograph uses pictures to give number facts. To get all of the information that the pictograph has to give, you need to do something more than to glance at it. You must translate the pictures into

numbers, and sometimes do some computing. You will be asked some questions about the pictograph below which will help you to learn how to work with pictographs.

The Number of Men Employed by the Canadian Pacific Railway to Build the Railroad



Each Figure Represents 1,000 Workers

1. What does this pictograph show? _____
2. What three groups are compared? _____
3. How many workers does each figure represent? _____
4. How many workers did the Canadian Pacific Railway have? _____
5. How many workers did the British Columbia group have? _____
6. Draw stick figures to represent 4,500 workers. Do this on a separate piece of paper.

A Divided Bar Graph

Another kind of graph is one in which one long bar is divided into parts. Such a graph is shown below.

The questions beneath the graph will guide you in a procedure to use in reading a divided bar graph.



Different Kinds of Country Covered by the Canadian Pacific Railway

1. Which kind of territory was found in the shortest distance on the route? _____
2. How much more prairie land was there than mountainous land? _____
3. How does the distance covered by mountains and prairie together compare with the distance covered by forest, swamp, rock, etc.? _____
4. What was the total length of the territory covered by the Canadian Pacific Railway? _____
5. About what fractional part of the route had mountains on it? _____
6. About what fractional part was prairie? _____
7. About what fractional part was forest, swamp, rock, etc.? _____

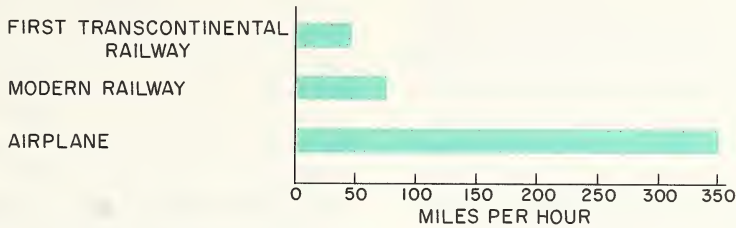
Horizontal Bar Graph

The graph below is called a *horizontal bar graph*. It gets its name from the fact that its bars extend across the page horizontally. This kind of graph is used more often than any other kind.

The line at the bottom of the graph is called the *horizontal axis*. The line at the left of the graph is

called the *vertical axis*. In reading graphs of this kind it is very important that you read and understand the numbers or words on the horizontal axis, and those on the vertical axis.

See how well you can read this kind of a graph with the use of the questions below.



Speed of Different Means of Crossing Canada

This horizontal bar graph was made by a student to show the speed of crossing Canada by different means of transportation.

1. What do the numbers on the horizontal axis represent? _____
2. What do the words on the vertical axis represent? _____

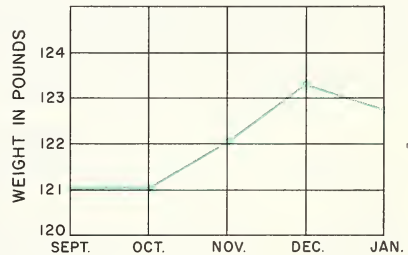
3. What is the approximate speed per hour of the airplane? _____ The modern train? _____ The first transcontinental railway? _____
4. How many hours would the modern train take to travel as far as an airplane can travel in one hour? _____

A Line Graph

A line graph is much like a bar graph except that a line is used instead of bars. Dots are placed at points which show where certain numbers fall. Then the dots are connected with lines.

In reading a line graph:

1. Read the phrase beneath or above the graph to make sure that you understand what the graph represents.
2. Look at the numbers on one axis and find out what they represent.
3. Read the words or abbreviations on the other axis and think about their meaning.



Steve's Increase in Weight

Steve read that railway workers were strong, hardy men. He thought that he could be like these men, so he drew a line graph of his own weight from month to month on the blackboard in the gym.

1. What does the graph as a whole represent? _____
2. What do the numbers to the left of the vertical axis represent? _____

3. What do the abbreviations below the horizontal axis represent? _____
4. During which months did Steve weigh the least? _____
5. Which month shows Steve to be heavier than 123? _____
6. During which month did Steve lose some of his weight? _____

A Circle Graph

A circle graph is another kind of graph which helps you to grasp comparisons quickly. It is one of the easiest graphs to read. See how well you can interpret the one above without special directions.

The graph was drawn to show a possible way in which one railway worker might have spent his salary. A glance gives you an impression in regard to the amount of salary he spent for each of the different items. If you really *read* the graph through, you will go further and decide on the fractional part or per cent of his whole salary which he spent for each item.

A Railway Worker's Budget for 1 Year at a Salary of \$900



1. Thinking in terms of fractions, what part of his total salary did he spend for each of these items?

Food _____ Clothing _____ Recreation _____

Miscellaneous _____

2. Thinking in terms of percentage, what per cent of his total salary did he spend for each item?

Food _____ Clothing _____ Recreation _____

Miscellaneous _____

3. Suppose that his salary was \$900 for the year:

How much did he spend for clothes? _____

How much did he spend for food? _____

How much did he spend for miscellaneous things?

How much did he spend for recreation? _____

How much for food and clothes? _____

Making a Graph of Your Own

It will help you to read other people's graphs if you make a graph of your own.

Make a bar graph to compare the distances from the earth to the sun and some of the different planets.

Here are your data:

<i>Sun and Planets</i>	<i>Millions of Miles from the Earth</i>
Venus	26
Mars	48
Mercury	57
The sun	93

Get a piece of unruled paper.

Draw a vertical axis $2\frac{3}{4}$ inches high.

Draw a horizontal axis 5 inches long.

Mark off spaces on each axis $\frac{1}{4}$ inch apart.

Draw horizontal and vertical lines, making quarter-inch squares.

Let each square on your horizontal axis represent 5 million miles. Label each line with a number, starting with 0 at the left and numbering by 5's to 100 at the right. Then write "Millions of Miles" to the left of this row of figures.

Opposite the vertical axis, write the names of the three planets and the sun. Write these opposite the second, fourth, sixth, and eighth squares, with Venus nearest the top. From the left of each of these names block in squares until you have bars showing the distance from the earth to each of the four.

Write a title under the graph.

Applying What You Have Learned About Reading Graphs

You have learned that you can get several different kinds of information from one graph. You have also learned that in order to understand a graph you must carefully read: (1) the phrase above or beneath the graph that tells what is being graphed; (2) the words that tell you what items are being represented in the graph; and (3) the number or numbers that tell you about quantity or units of measurement.

Once you have read and made sure that you understand these three things, then you know that you

must study the graph itself, making comparisons and drawing conclusions. See how many different pieces of information you can "wring" from the graph.

Graphs are nearly always followed with a section of printed matter which discusses the same subject as the graph. Always study the graph carefully *before* reading the printed matter. Your reading will be more interesting and meaningful if you have first gotten as much information as possible from the graph.

MARKING WORDS WITH TWO ACCENTS

You have had some work in placing an accent mark after one syllable in a word which is stressed more strongly than any other syllable.

In some words of three or more syllables, *two* syllables are accented. In the word *transportation*, the first syllable trans is said more strongly than the syllable por or tion, and the syllable ta is said more strongly than any of the other three syllables. In this word the syllable which is stressed most strongly is said to have the *primary accent* and is marked with a strong accent mark. The syllable that is stressed less strongly is said to have the *secondary accent* and is marked with a lighter accent mark. The primary and secondary accent marks in *transportation* would be placed as follows: trans'por ta'tion. In some dictionaries one accent mark is used for the primary accent and two for the secondary accent. In your

work on these pages follow Webster's plan, which is one heavy and one light accent mark.

Divide each of the words below into syllables. Write the divided word on the line to the right of the printed word, leaving a little space between each two syllables.

You will need to use all the syllabication guides: (1) Divide between words forming compounds; (2) divide between double consonants; (3) divide between separately sounded consonants; (4) divide before single consonants between sounded vowels; (5) consider blends and speech sounds as single consonants; (treat le, dle, and similar formations as syllables); (6) Divide between root words, prefixes, suffixes.

After you have divided a word into syllables, place primary and secondary accent marks where you think they belong.

kangaroo _____

crackerjack _____

Manitoba _____

classification _____

manufacture _____

continental _____

Saskatoon _____

exploration _____

automobile _____

hippopotamus _____

armadillo _____

Newfoundland _____

independent _____

undershirt _____

territory _____

electromagnet _____

ONE VOWEL SOUND FOR A, E, O, AND U

Sometimes the vowel a or e or o or u may have a soft sound which is something like short u pronounced very lightly.

Pronounce *balloon*. Did the a sound like a soft, short u?

Pronounce *silent*. Did the e sound like a soft, short u?

Pronounce *connect*. Did the o sound like a soft, short u?

Pronounce *support*. Did the u have the sound of a soft, light u?

When a vowel has this sound, which is common to four vowels, it has the *schwa* sound.

The *schwa* sound always occurs in an unaccented syllable, never in a syllable with an accent.

Draw a line between the two syllables in each of the words below. Place a check mark above the *schwa* sound in each word.

ahead

sofa

abound

balance

abridge

parade

wisdom

suspect

allow

angel

fallen

bottom

canoe

canyon

freshen

occur

treatment

suppose

signal

postman

recent

spoken

shaken

barrel

reckon

await

soften

account

quicken

wagon

circus

bacon

WORKING WITH SCIENCE WORDS

The words below are in practically all *science* textbooks at your level. You will be better able to read in your *science books* if you can pronounce all of these words correctly and if you understand their meaning as used in *science*.

Study the pronunciation of each of these words. Say the word to yourself, pronouncing it distinctly. Then read the meaning of the word and think about it.

ampere ăm'pēr	A unit used in measuring the amount of electric current passing through a circuit.
asteroid ăs'tēr oid	Any one of the many small planets found mainly between Jupiter and Mars.
astrology ăs trōl'ō jī	A false science which pretends to predict future events from the position of the stars.
conservation kōn'sēr vā'shŭn	Saving or replacing some natural resource for future use.
constellation kōn'stē lā'shŭn	A group of stars to which a name has been given.
contour plowing kōn'tōŕ	Plowing in level lines across a slope, rather than up and down the slopes; a common device for conserving soil and water.
eclipse ē klips'	Lunar eclipse—shutting out the light of the moon when the earth passes between it and the sun. Solar eclipse—shutting out the light of the sun when the moon passes between it and the earth.
electromagnet ē lēk'trō mǎg'nēt	A magnet in which magnetism has been produced by an electric current.
galaxy gāl'ăk sī	A great island in space made up of millions of stars.
Galileo gāl'i lēō	An Italian astronomer who showed the world how to use facts by carrying on experiments.
generator jēn'ēr ā'tēr	A machine which changes mechanical energy to electrical energy.
hydroelectric power hī'drō ē lēk'trīk	Electric power produced by water.
magnitude mǎg'nī tūd	A measure of the brightness of a star.

See if you know the meaning of these words as used in *science*. Write one of the words in each of the blank spaces below. Add s if necessary.

- The name of a well-known Italian astronomer is _____.
- A _____ is a group of stars, such as the Big Dipper.
- The Milky Way is a great swarm of millions of stars. It is a _____.
- There are thousands of tiny planets between Mars and Jupiter. Any one of these little planets is an _____.
- When the moon shuts out the light by passing between the sun and the earth we are said to have a solar _____.
- Scientists are able to measure the brightness or _____ of a star.
- Some people believe that they can have their fortunes told from the position of the stars. They believe in _____.
- Mr. Stevens wanted to keep the topsoil on one of his hillsides from being washed away. So he used the plan of _____ around the hill.
- Mr. Stevens believed in _____ of soil.
- The man who reads your electric meter can tell how many _____ of electric current you have used.
- It is possible to make a magnet by passing electricity around a piece of iron. Such a magnet is called an _____.
- If you should go into an electric plant, you could see a _____ making electric energy.
- If a generator is run by water, it is said to be producing _____ power.

FINDING CAUSES AND EFFECTS

Much of your reading in *geography*, *history*, and *science* deals with causes and effects. If you can quickly grasp causes and effects, you will be greatly helped in studying these subjects.

You will be given practice on this page in finding causes and effects.

Causes and Effects

In the paragraphs below, the causes are given which lead up to some effect. Find the cause in each paragraph and sum it up in a few words on the line following *Cause*. Then find the effect and sum it up in a few words on the line following the word *Effect*.

1. There was a time when great ice sheets swept down over Canada and the northern part of the United States. These ice sheets changed the contour of the land. As they swept along they carried rocks and gravel in front of them. Often they scooped out great cavities in the earth. The Great Lakes and many of the smaller lakes in Ontario and the western provinces were made by the movements of these great ice sheets.

Cause: _____

Effect: _____

2. The soils in many of our dry lands are rich, but they cannot grow crops. Growing plants need water. When water is brought in through pipes and ditches, crops grow very well. Irrigation has made deserts bloom.

Cause: _____

Effect: _____

3. There are heavy forests in the tropical regions, but getting logs out of these forests is a difficult problem. The ground is water-soaked, there are few railroads or highways, and most of the logs are too heavy to float on the streams. Because of these reasons, very little logging is done in the tropical forests.

Cause: _____

Effect: _____

Effects and Causes

In each of the selections below, the effect is given first. Then follows an explanation of the cause.

After reading each selection sum up and write the effect and its cause.

1. A dog turns around before lying down. Why does he do this?

This habit is supposed to be inherited. The wild dog turned round and round to trample down the grass so he would have a smooth bed. Our dogs today need not to do this. But they are thought to go through this same activity because their ancestors did.

Effect: _____

Cause: _____

2. When you pop corn, the small hard kernels suddenly burst into large, soft, snow-white bodies. Why do the hard kernels make this sudden change?

There is some moisture inside of each kernel. When you hold the kernels over the fire, this moisture turns to steam. The steam bursts the outer shell of the kernel and turns it inside out.

Effect: _____

Cause: _____

3. Bird's-eye maple is beautiful and expensive wood. It has small round spots in it that look something like bird's eyes. What causes these marks?

The marks are the result of an injury to the bark. When the bark is injured the trunk begins to send out weak little sprouts. Each of these sprouts becomes the center of rings that make the interesting markings.

Effect: _____

Cause: _____

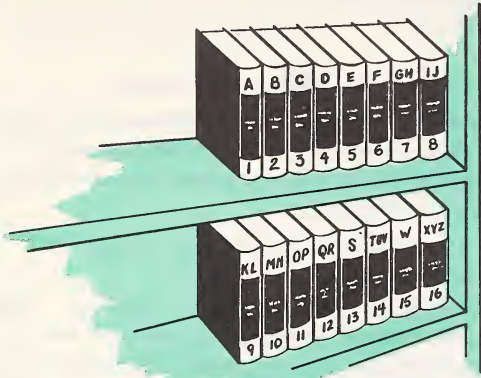
USING AN ENCYCLOPEDIA

Among your reference books, encyclopedias are the most exciting. Encyclopedias contain informa-

tion about every topic in the world—and even in the skies above. Hundreds of experts work to make a set of encyclopedias. Not only do these people take great care in gathering accurate facts, but they also take care to arrange the facts so that you can find them easily.

Have you learned the short cuts in using an encyclopedia? Can you find what you want *very* quickly?

No matter how well you think you can use an encyclopedia, you can always improve. Additional practice is given to you at this point. See how fast you can answer the questions or follow the directions on these pages.



Locating Volumes

In a dictionary, words are arranged alphabetically in a single volume. Since several volumes are needed to contain all of the information printed in encyclopedias, only words having to do with a part of the alphabet can be placed in one volume. And as you know, a letter or a group of letters representing the words in each volume is placed on the back

of the volume. Each volume is also numbered in the order in which the letters of the alphabet are represented.

A set of encyclopedias is pictured above. See how quickly you can find and write the number of the volume in which each of these topics would be found:

- | | | | |
|------------------|----------------------|------------------|------------------|
| 1. birds _____ | 4. whales _____ | 7. flags _____ | 10. Africa _____ |
| 2. India _____ | 5. glass _____ | 8. diamond _____ | 11. cattle _____ |
| 3. Toronto _____ | 6. electricity _____ | 9. snakes _____ | 12. Japan _____ |

It is easy to find in which volume each of the above topics is discussed because you have just one word to look up. If there are two words in a topic, you have to decide which one of the two to look up.

If you wish to look up a person other than royalty you look for his last name. In looking up Sir Edward Gordon Craig, you will find this gentleman's name listed in the C volume as "Craig, Sir Edward Gordon." In case of royalty, you look for the first

name. If you were looking for George IV of the House of Hanover, you would look under G for *George*.

Other two-word topics are listed under the first of the two words. Northwest Territories is listed under *North*, and New Westminster under *New*.

See how quickly you can write the number of the volume in which you would find each of the topics below.

- | | |
|--------------------------------|----------------------------|
| 1. Tom Thomson _____ | 6. British Columbia _____ |
| 2. Annapolis Valley _____ | 7. Elizabeth II _____ |
| 3. Johann Sebastian Bach _____ | 8. Wilder Penfield _____ |
| 4. Canadian Government _____ | 9. Pauline Johnson _____ |
| 5. first aid _____ | 10. Charles Saunders _____ |

Using An Encyclopedia Index

All encyclopedias have indexes. This index will give you much information. In the index of one encyclopedia a definition is given for most of the topics. Tables of figures are sometimes presented in an index. You are told where you can find pictures and maps based on the topics. The list of items under each main topic summarizes the information in the topic.

The chief value of the index, however, is to tell you where to look if you wish to find *all* of the information which the complete set of volumes has to give about a topic. It is valuable also if you wish to look up information on some one aspect of the larger topic.

If you had to write a paper on the Telephone, it

wouldn't be enough just to read about it in Volume *T*. Turning to the index you would find references to many pages in many different volumes where you would find information in addition to that given in the *T* volume. These additional references are called "cross references." They cut across several volumes.

In some encyclopedias, the index uses the *letter* of the volume in giving cross references, as C-9. In others, the *number* of the volume is used, as 3-9. In case the number of a volume is used in a cross reference, that number appears in boldface type.

Study the entries below and answer the questions that follow these entries.*

Canada, history of C-101-12, *chart* H-415, *pictures* C-101-5, 109, 111, *Reference-Outline* C-112. For a list of governors general and prime ministers, *see table* on preceding page
Acadians banished A-6: Evangeline Memorial Park, *picture* A-6
Alaska boundary dispute A-147, R-286, C-109
Baldwin B-22, C-106
Bering Sea controversy C-109
bibliography C-96d
Bienville B-155
buys land from Hudson's Bay Company C-107
Cadillac C-10
Canadian Pacific built C-108
Cartier explores St. Lawrence C-145-6, C-102
Champlain founds Port Royal and Quebec C-207, C-102
discovery C-101-2, *picture* C-102: Cabot C-9
Dominion created C-107: Macdonald M-6, C-107, 108; Tupper T-244
England gains Canada C-104
exploration of the West C-104-5
"Family Compact" government C-106
French and Indian War F-435
French claim A-200, C-102
French-Indian council (1684), picture F-182

fur trade F-494-8, *pictures* F-495, 497
government of New France C-103: Frontenac F-463
Hudson H-511
Hudson's Bay Company H-512, C-103
Iberville I-1
King George's War K-56
King William's War K-57
land, growth of, chart C-89
La Salle L-128-9
Loyalist immigration from United States C-104: New Brunswick N-164, *picture* N-164; Nova Scotia N-375; Ontario O-459; Saint John S-18

Leacock (lĕ'kōk), Stephen Butler (1869-1944), Canadian educator and humorist, born Swanmoor, Hampshire, England; professor of political economy at University of Chicago 1899-1903, at McGill University, Montreal, Canada, 1908-36; author of biographies of Charles Dickens and Mark Twain, and of books on history, economics, and political science; won a wider public with his delightful nonsensical sketches C-116, 117

Mars, a planet P-353-4, 351-2, *diagrams* P-352-3, *pictures* M-118, P-354, *table* P-353
canals, picture P-354
Kepler studies motions K-46
origin of name M-118
retrograde motion P-351-2
satellites (moons) P-354
trip to S-347

Telephone T-45-51, *pictures* T-46-51
Bell system T-50, 51
broadcasts brought to studio by R-58
communication speeded by T-45-6, C-484
conversations, etiquette C-553
dial system T-47-9, *diagram* T-48, *pictures* T-49
dictograph D-113
electric currents in T-46, *pictures* T-46
exchange T-46-50, *pictures* T-48-9: class visits, *picture* E-297
infrared rays I-189
International Telecommunication Union U-285
invention and development T-50-1, E-281: Bell B-130; Pupin P-535
long-distance filters C-624
long-distance service T-50-1
number of telephones in world

1. Name five men concerned with Canadian history. _____
2. In what volume and on what page would you find information about the dictograph? _____
3. Where would you look for pictures of Mars or things related to it? _____
4. Where would you find information on Canada's boundary dispute with Alaska? _____
5. During what years did Leacock live? _____
6. Where would you look to find information about the Hudson's Bay Company? _____
7. Where would you look to find information about long-distance telephone service? _____
8. Where would you find a diagram of the dial system? _____
9. Where would you find the origin of the name Mars? _____
10. Where would you find information about a possible trip to Mars? _____

* Reprinted from *Compton's Pictured Encyclopedia*, 1957 edition, volumes for the letters C, L, M, and T. Copyright by F. E. Compton & Co., Chicago.

UNIT SEVEN

REBELLION IN THE WEST



Métis (mā tēs') is a person of French and Indian ancestry.

Riel (Rē ěl) is the name of the leader of the Métis.

The selection below is a short biography of Louis Riel, the most famous Métis of Canada. To many he was a hero; to others he was a traitor, guilty of high treason.

Certain qualities make a leader. These qualities determine, in large measure, the actions of his group and the sequence of events evolving from these actions. As you read the biography below, note the qualities Riel possessed and their influence on the course of the rebellion.

Lagimodière (lăj'i mōd'ī ār) is the name of Riel's grandmother.

Beginning time: Hr. _____ Min. _____

LOUIS RIEL, MÉTIS HERO

One day in the Red River country that was soon to become part of a new province, Manitoba, some Canadian surveyors arrived at a Métis farm. Métis farms were laid out in long strips running back from the edge of a river. For weeks the surveyors had been watched uneasily as they went about the country, measuring off the land in squares. Just as they laid out their measuring chain on this farm, a band of eighteen young Métis suddenly appeared and stood on the chain. They carried no weapons. They just stood on the chain. The leader said, "You go no farther." The surveyors picked up their chain and departed. The leader of the band was Louis Riel.

Louis Riel, who was to become the most famous Métis of Canada, was born in St. Boniface, on the Red River. His father was a trader, of French and Indian ancestry. His grandmother, Marie Ann Lagimodière, was the first white woman to make her home in the Red River country.

Although only one-eighth Cree, Louis proudly called himself a Métis and possessed many characteristics in common with these people of French and Indian ancestry. His interest and concern were, all his life, with the Métis. No doubt the sympathy and understanding which he gave them had been fostered by his early environment. He lived among Métis neighbours, and played, and hunted, fished, and trapped

with Métis boys. He saw his father champion the cause of his people when the Hudson's Bay Company policy threatened their trading rights.

Louis Riel grew up during the golden age of the Métis nation. He saw and understood their way of life at its best and wanted to preserve it for his people.

Their land was the wide, empty prairies over which they roamed at will. They were a happy people, care-free and sometimes wild, spending most of their time fishing, trapping, and hunting, but doing a little farming too on their narrow strip farms. The quiet pursuits probably gave them their love of the beauty and peace of the prairies. The buffalo hunt satisfied their need for wild excitement and danger. They were fiercely independent, submitting to the discipline of a leader only when they saw the necessity of so doing. These qualities of the Métis Riel possessed.

These people loved music and dancing, and there was always a fiddler available to supply music for the celebrations of marriages, christenings, and homecomings which provided many welcome occasions for whole-hearted hospitality and fun. As a young boy Louis was often a spectator, and perhaps even a happy participant, in these simple pleasures. It is no wonder that, when he was grown, he understood his people's need for their way of life and championed their right to keep it.

Because he was unusually intelligent, Louis was sent to school. Returning from Montreal at age twenty-five, he found the Métis about to lose their land and way of life in the Government process of creating the province of Manitoba. They had no one to help them—to speak for them. Riel, highly educated and a remarkable orator, understanding them and their needs and sharing many of their qualities, was their natural choice for a leader.

Because the Métis wanted self-government, Riel prevented a newly appointed governor from entering their country. He then rashly seized Fort Garry and set up a government. Many white settlers combined with the Métis to elect him president, but some Canadians marched to attack Fort Garry. Riel imprisoned them.

Riel was hot-tempered and when aroused to anger was inclined to act rashly and without restraint. One

prisoner so aroused his anger by taunts and insults that finally Riel had him tried for treason. The prisoner was sentenced and executed.

Riel eluded the Canadian government forces sent to arrest him and escaped to the United States. Before finally taking up a quiet life at a mission school in Montana, he was twice committed to an asylum.

In 1884 he returned to Canada to lead once more the Métis in their struggle for their rights in what is now the province of Saskatchewan. Although Riel abhorred bloodshed, and would not even carry a gun into battle, he ordered an armed rebellion when his petitions to the Dominion Government were ignored.

At the end of the rebellion of 1885 Riel was condemned to death for treason. At Regina, on November 16, 1885, Louis Riel was hanged.

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>
Ending time:	_____	_____	_____
Beginning time:	_____	_____	_____

No. words 739
 No. seconds _____ $\times 60 =$ _____ WPM

COMPREHENSION QUESTIONS

1. Give the dates of Louis Riel's life. _____

2. Where did he attend school? _____

3. Why did he go so far away to school? _____

4. Where did the Métis live? _____

5. Why were the surveyors watched uneasily by the people? _____

6. Why did Riel feel responsible for the people? _____

7. Were the governments set up by Riel legal? _____

8. List five qualities Riel possessed:

DISCUSSION QUESTIONS

Write your answers on a separate piece of paper.

1. Why were the surveyors laying out the land in squares?
2. How do you think the surveyors felt when the Métis stopped them at the farm?
3. Give three reasons why the Métis resented a change in their way of living.
4. Do you think Riel's education helped him to become a leader? Why?
5. If Riel had not been a hot-tempered person how might events have been different?
6. Was Riel a patriot or a rebel, or both? Why do you think so?
7. Write a paragraph assessing Riel's contribution to Canada's development as a nation.

WHY WAS THERE A REBELLION IN 1885?

You have read of the man who led the Métis in two rebellions in their struggle to maintain their rights in the face of the advance of the Confederation of Canada. The following selection poses and answers the question: What caused the rebellion of 1885?

Anything that has to do with income and spending money can be described as *economic* (ē kə nom'ik).

Anything passed on to people from their ancestors is a *heritage* (her'a tij).

A wish to act in a certain way is an *inclination* (in'klə nā'shan).

A formal written request or any formal asking is a *petition* (pa tish'an).

Anything that has to do with the origin and ways of a group can be described as *sociological* (sō'sī ō lōj'ī kāl).

Batoche (bə'tōsh) is a Métis village on the South Saskatchewan River about 35 miles southwest of Prince Albert.

CAUSES OF THE REBELLION OF 1885

The chief causes of the rebellion were economic. After their rebellion in the part of Canada now called Manitoba, most of the Métis moved west, and many settled along the Saskatchewan River on strip farms. They valued their homes and land but by heritage and inclination were not disposed to earn a living by farming. At first they hunted and trapped. The buffalo not only supplied the Métis with food and sometimes clothing, but provided a surplus of these for sale. By 1880 the once vast herds of buffalo had disappeared, largely because of the wasteful slaughter of them by white men. Deprived of this source of income, many Métis turned to freighting goods from Winnipeg and to depending more on their farms. Growing anxious now to have titles to their lands, they petitioned the Canadian Government for them but were ignored. Adding to their anxiety came government surveyors who began to lay out the land in squares that often crossed the strip farms. To the Métis, it appeared that the Government was going to take their farms from them. Now came the railway, bringing in more and more white settlers to take possession of the land over which the Métis had been free to roam—hunting, fishing, and trapping.

There was also a sociological cause of the rebellion. The white settlers' way of life was quite different from that of the Métis and held no appeal for them. When the white people had moved into the new province of Manitoba in large numbers, the Métis realized that they must either give up their way of life and adopt that of the white man or move further west. Most of them chose the latter course. Now the white settlers were again moving into the land. Dismayed at the prospect of either adopting a way of life they did not like or again having to move further west, the Métis grew angry.

They needed a leader—someone who would tell them what to do; someone who could stand up to the white man's Government and demand that the Métis' rights be guaranteed. Riel was asked to return to lead them.

On July 1, 1884, Riel arrived at Batoche. His efforts to help his people by petitions to the government at Ottawa were ignored. Riel called for an armed revolt. Fighting first took place in March, 1885, near Duck Lake, where the Métis defeated a force of Mounties. The Rebellion of 1885 had begun.

ACTIVITY 1

Write the main topics of the paragraphs in outline form. The first topic is written for you.

I. *Economic Causes were of first importance.*

A. _____

B. _____

- C. _____
- D. _____
- E. _____
- F. _____
- II. _____
- A. _____
- B. _____
- III. _____
- A. _____
- B. _____
- IV. _____
- A. _____
- B. _____
- C. _____
- D. _____

ACTIVITY 2

Write the details under each of the main headings which you have already written in the outline above.

ACTIVITY 3

Put yourself in the place of a Métis who was supporting his family by farming in the Saskatchewan

River country in 1880. Write a paragraph telling how you would feel and what you would do.

Put yourself in the place of Sir John A. Macdonald, the Prime Minister of Canada. Write a paragraph giving his views of the situation in northwest Canada in 1884.

Applying What You Have Learned About Reading Social Studies Material

When you are asked to give a report on some *social studies* subject, there is no better way of preparing yourself than by making an outline. In reading to make an outline, read and reread the selection or chapter on which you are to report. Read first to get the over-all "picture" and locate the main topics.

Phrase the main topics and write them in your outline. Read the selection a second time to pick out the details that belong with each topic. Then, as you study the selection, fill in your outline. You should try to state the gist of each detail in as few words as you possibly can.



THE BAD LANDS OF DRUMHELLER TELL THE STORY OF THE AGES

Most of the history you have been reading happened within four hundred years. Millions of years ago, however, animals roamed the land we now call Canada. How do we know this? Layers of rock tell the geologist the story of the earth's history. Some of the facts which geologists have gathered from a study of these rocks are given in the selection below.

This selection contains two different patterns of writing, (1) cause and effect, and (2) classification. You should read each pattern with a different purpose in mind.

1. First *scan* the article to find the cause and effect paragraphs—paragraphs which tell of something that has happened and which give the cause of this thing happening. Some clue words and phrases which will help you to identify cause-and-effect paragraphs are “the results” (there has to be some cause if “results” are produced), “because,” “caused,” “the cause

of,” and “the reason is.” Don’t read the selection carefully, simply *scan* for the above phrases in order to locate the cause-and-effect paragraphs.

2. *Scan* again for paragraphs that have to do with classifications. Clue phrases to look for are: “three different kinds,” “three different stages.”

3. Now you are ready to read the selection carefully. Read the cause-and-effect paragraphs looking especially (a) for the effect or result of something happening, and (b) the cause of this thing happening. If you grasp these two points in each of the cause-and-effect paragraphs, you will have read them well.

4. Read the classification paragraphs for the purpose of finding what the classifications are and what makes each one different. Time your careful reading.

Soil or gravel that drops to the bottom of a stream or ocean is said to have been *deposited* (dē pōz’it ēd).

Anything that furnishes proof is *evidence* (ēv’i-dēns).

Matter that settles to the bottom in a liquid is said to be *sedimentary* (sēd’i mēn’tā rī). Sand that

settles to the ocean bottom makes sedimentary rock.

Bentonite (bēn’tōn it) is a soft, porous rock made of clayey material.

Decomposition (dē’kom pə zish’ən) is the act of decomposing, as rotting.

Hoodoo (hū’dū) is the name given to certain types of rock formation.

Beginning time: Hr. _____ Min. _____

HOW GEOLOGISTS READ THE HISTORY OF THE EARTH FROM ROCK LAYERS

The Bad Lands, situated near Drumheller in southern Alberta, are visited each year by many tourists who are fascinated by the queer-shaped rocks and are eager to discover the dinosaur fossils. To the scientists who study rocks, however, this valley carved by the Red Deer River reveals many facts about the earth’s history. How do these geologists read the history of the earth in layers of rocks, and what story is told?

The sightseer who stands on the rim of the hill and looks down upon this part of the Red Deer Valley is looking at the results of a million years’ work of moving

air and water. Once the Red Deer River, rising in the Rocky Mountains, flowed over fairly level ground. Gradually over the years it has carved out a valley which is 400 feet deep and a mile wide. If a person stands in the valley and looks at the sloping sides, he can see several layers of rocks.

These layers of rock give us a general outline of much of the earth’s history. The alternate bands of color, black, brown, gray, and white, not only are beautiful with the sun glinting on them, but indicate the presence of coal, ironstone, shale, and clay.

The layers nearest the floor of the valley are the

oldest because they were deposited first. While the upper or more recent layers are horizontal, many of the lower or older layers are tipped or tilted. The geologist is interested in the cause of these uneven layers. He knows that great forces have been at work either lifting one end and lowering the other or pressing sideways to cause the rock layers to fold. You can readily understand this process of folding by pushing toward the middle on the ends of a stack of thin sheets of colored modeling clay. When the hump or "mountain" is cut through across the ridge, the curved rock layers are easily seen. Perhaps you have noticed this tilted or folded condition in rock layers along a road or railroad where the right-of-way has cut through some natural mound of rock.

Sometimes one can see cracks in rock layers. These are caused by rocks which have broken and have slid past each other. The rock layers are no longer continuous, but suddenly come to an abrupt end. The same layer continues on, but higher or lower on the other side of this crack, which is called a fault.

There are layers of sedimentary rocks in the Drumheller Valley. Continents were once partly or wholly covered with oceans. There are certain kinds of rocks which are made under water. The pressure of the ocean is very great. It squeezes particles of soil, sand, shells, and dead sea animals solidly together. The result is a hard substance known as sedimentary rock. In places where there was once a sea, you can still find layers of rock which were made in this manner.

There are three kinds of sedimentary rocks. One kind is limestone, which is composed chiefly of coral and the shells of other animals. Another kind is sandstone. This rock is made up of grains of sand. A third kind of rock is called shale. This rock is made by water pressure on mud in which there are the remains of plant and animal life.

Fossils are found in sedimentary rocks. They are the remains or forms of plants and animals preserved in the rock. By studying these fossils, the geologist uncovers the story of life on earth. From such evidence we have proof that the first living things were very simple, and that as time went by they became more complex.

Fossils reveal three different stages in the development of life. In the first stage there were only plant forms. These plant forms were very simple and grew in water only. During this second stage, simple sea animals, fish, and reptiles appeared in the ocean. Birds and insects began to live on the land, and plants began to grow on land. Then came the third stage of complex plants and mammals.

The Drumheller Valley has been a treasure trove for geologists. Over 60 distinct species of dinosaurs, which roamed this part of the country 100 million years ago, have been found here and are now in museums in various parts of the world. The petrified skeletons of sharks, alligators, and other reptiles, as well as a variety of plants, berries, and cones, have also been unearthed.

Another interesting feature of this area for geologists is a type of clay called bentonite, which was formed by the decomposition of volcanic ash and dust. It is thought that this ash came from erupting volcanoes in what is now the state of Montana and was deposited upon the huge inland sea which covered Alberta. Indians used the clay as a substitute for soap, but in modern times it is used in the refining of gasoline and oils. Fantastic rock shapes called Hoodoos have been formed by the wind, rain, and the constant freezing and thawing, washing away this type of clay and leaving the hard rock standing.

Rocks, though lifeless, can often reveal secrets of living things of the past.

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>	
Ending time:	_____	_____	_____	No. words <u>869</u>
Beginning time:	_____	_____	_____	No. seconds _____ × 60 = _____ WPM

ACTIVITY 1—STATING CAUSES

Effect

Cause

- | | |
|---|-------|
| The lowest layers are the oldest. | _____ |
| Many of the older layers are tipped or tilted. | _____ |
| Sometimes one can see cracks in rock layers. | _____ |
| The result is a hard substance known as sedimentary rock. | _____ |
| Hoodoos are fantastic rock shapes. | _____ |

ACTIVITY 2—CLASSIFYING THINGS

On a separate piece of paper, name three kinds of sedimentary rocks. Opposite each name tell what makes that rock different from the others.

Comprehension score: _____ WPM: _____

READING FORMULAS

No doubt you enjoyed translating the Morse Code into words, and translating words into the Morse Code. You can have just as much fun translating words into formulas, and formulas into words.

Translating and applying formulas is another kind of reading which you will need to do often as you go on through high school. You can develop your skill in reading formulas as readily as you can develop skill in reading chapters in your *science* or *social studies* books. On this page and the next one you will be given practice to increase this skill.

Translating the Formula for Finding the Perimeter of a Square *

A *perimeter*, as you already know, is the distance around some object or figure. The perimeter of a table top would be the distance around the four sides of the top.

A *formula* is a short way to write a general rule.

Actually, a formula says the same thing as the rule, except that while the rule is stated in words, the formula is stated in numbers and letters. Very often the letters of the formula are the first letters of the important words of the rule.

For example, there is a rule that the perimeter of a square is equal to the sum of the lengths of its four equal sides. To express this rule by formula we state the important words of the rule and then substitute letters, numbers, and symbols for these important words:

Perimeter equals one side plus one side plus one side plus one side

$$P = 1s + 1s + 1s + 1s$$

or simply

$$P = 4s$$

where $4s$ means "4 times s ." Therefore $P = 4s$ is the formula for the perimeter of a square, in which P stands for the perimeter and s for the length of one of its equal sides.

In order to solve a problem with the use of this formula, we simply substitute for s the number that stands for the length of one of the sides.

1. How much fence will it take to enclose a square field whose sides are each 300 ft. long?

Since in this problem we are looking for the value of P when $s = 300$ ft., we substitute 300 for s and compute:

Formula: $P = 4s$

Substitution: $P = 4 \times 300$ feet

Answer: $P = 1,200$ feet

* Based upon material prepared by Francis J. Mueller.

1. In learning to read the formulas below, the most important thing for you to do is to make sure that you understand the explanation of the formula. Read the explanation slowly and try to grasp every word of it. The explanation gives you the *meaning* of the formula. Getting the meaning is the first and most important step in working with formulas.

2. After you know the formula and understand it, try applying it to problems. Simply substitute the numbers in each problem for letters in the formula.

3. Work the problem, using the formula.

Solve the problems below in the same way, writing the formula, the substitution, and the answer.

You will need to make all of your computations on a separate piece of paper.

2. One Indian reservation was 300 miles square. How many miles would an Indian travel if he rode his pony entirely around the reservation?

Formula: _____

Substitution: _____

Answer: _____

Translating the Formula for Finding the Area of a Rectangle *

Another rule, which you may already know, is that the area of a rectangle is equal to its length times its width. To state this rule as a formula, we first repeat its important words, and then substitute letters and symbols for them:

Area equals length times width

$$A = l \times w$$

Therefore $A = lw$ is the formula to find the area of a rectangle. When we want to use this formula, we substitute the number for the length of the rectangle for l , and the number for the width for w .

1. A regulation tennis court is 78 ft. long and 36 ft. wide. What is the area of its playing surface?

Since a tennis court is rectangular, the formula used to find the area of its surface is $A = lw$. A , of course, is what we want to know, l is 78 ft., and w is 36 ft.

Formula: $A = lw$

Substitution: $A = 78 \times 36$

Answer: $A = 2,808$

Now fill in the needed information under problem 2 on the next page.

2. The Kootenay National Park is 9 miles wide and 60 miles long. How many square miles are covered by this park?

Formula: _____

Substitution: _____

Answer: _____

Translating the Formula for Finding the Circumference of a Circle

The circumference of a circle, as you know, is the distance around the circle.

The circumference of any circle is about 3.14 times the diameter. The Greek letter π , which we spell out as *pi* (π), stands for the number 3.14.

So the formula for finding the circumference of a circle is:

$$\text{Circumference} = \pi \times \text{diameter}$$

or

$$C = \pi d$$

1. The diameter of Mars is 4,200 miles. What is its circumference?

Formula: $C = \pi d$

Substitution: $C = 3.14 \times 4,200$

Answer: $C = 13,188$ miles

You should now fill in the blank spaces under the problems below:

2. The diameter of the earth is 7,900 miles. What is the distance around the earth?

Formula: _____

Substitution: _____

Answer: _____

Translating Formulas into Words

Write the words for which each of the formulas stands. Do this without rereading anything on these two pages dealing with formulas.

$A = lw$: _____

$C = \pi d$: _____

$P = 4s$: _____

Selecting Formulas

Select the right formula to use in solving each of the problems below. Use the formula in working the problem.

1. How much fencing would a rancher need in order to make a square corral whose sides are each 36 ft. long?

Formula: _____ Answer: _____

2. The diameter of the sun is 864,400 miles. What is the circumference of the sun?

Formula: _____ Answer: _____

3. A store in a Nova Scotia town has a stone front. The store is 27 ft. wide and 38 ft. high. How many square feet of stone were needed to build the front of the store?

Formula: _____ Answer: _____

Writing Formulas

After doing all of the things which you have been doing with formulas, you probably understand formulas well enough to write some of your own. Try it!

1. Write a formula for finding the perimeter of a

rectangle: _____

2. Write a formula for finding the area of a square:

Applying What You Have Learned About Reading Formulas

You will meet a large number of formulas in your future *mathematics* work. These formulas call for a kind of reading different from any other kind discussed in this book, except your work with the Morse Code. In *mathematics* and *science*, however, you have to do several things that you didn't do with the Morse Code.

When you come to a new formula in one of your books, it will be helpful to you if you will do several of the things which you have been doing in working with formulas on these pages:

1. Read the explanation slowly and carefully and make sure you understand it.
2. Write the formula in words.
3. Write the formula in letters.
4. Substitute the numbers in a problem for the letters.
5. Work the problem according to the formula.
6. After you have learned several formulas, be very careful to select the right one to use with a new problem. All of your work will be wasted unless you use the right formula.

WORKING WITH MATHEMATICS WORDS AND PHRASES

The words and phrases below appear in widely used *mathematics* textbooks at your grade level. No doubt they are in the *mathematics* book which you are using.

Work out the pronunciation of each word or phrase. You may be mispronouncing some of these words or phrases which you think you are pronouncing correctly. Next study the meaning of each word or phrase to make sure you understand how the word is used in *mathematics*.

GEOMETRIC FIGURES USED IN MATHEMATICS

equilateral triangle A triangle with all three sides equal.
ē'kwī lāt'ēr āl



isosceles triangle A triangle having two equal sides.
ī sōs'ē lēz



scalene triangle A triangle with unequal sides and angles.
scā lēn'



right angle An angle in which the opening between the lines is 90° .



acute angle An angle in which the opening between the two lines is smaller than a right angle.
ā kūt'



obtuse angle An angle in which the opening between the two lines is larger than a right angle.
ōb tūs'



hypotenuse The side opposite the right angle of a right triangle.
hī pōt'ē nūs



pentagon A figure having five sides.
pēn'tā gōn



symmetry When the halves of a figure correspond in size, arrangement, and measurements, the figure is said to have *symmetry*.
sīm'ē trī



See how well you know the meanings of the words with which you have been working. Choose one word to write in each blank space in the sentences below, and follow the directions for drawing figures.

1. Ruth drew a triangle whose sides and angles were not equal. What would this figure be called?

2. A pentagon has _____ sides.

3. Draw a pentagon to show as nearly as possible what is meant by symmetry.

4. Draw a right angle:

5. Draw an obtuse angle:

6. Draw an acute angle:

7. Draw an equilateral triangle:

8. Draw an isosceles triangle:

9. Draw a right triangle. Use a dotted line for the hypotenuse.

SPEEDING UP YOUR DICTIONARY SKILLS

The speed with which you can find words quickly in a dictionary depends upon how well you know the alphabet and how well you can make use of alphabetical arrangement.

See how rapidly you can answer the questions below.

In which quarter of the alphabet does each of the following belong? Write *first*, *second*, *third*, or *fourth* after each letter.

w _____	q _____	l _____	s _____	r _____
b _____	a _____	p _____	m _____	d _____
k _____	h _____	c _____	i _____	o _____
y _____	f _____	j _____	e _____	u _____

It isn't enough that you be able to locate the first letter in a word quickly. After you find the section of the dictionary containing words beginning with that letter, you still have to find the word within this section. If you can quickly grasp the alphabetical arrangement within the word and then match it with the right guide word on the dictionary pages, you'll waste no time thumbing through the pages one by one.

Arrange these words in the order in which they would come in the *d* section of the dictionary:

doubt
delegate
double
Diesel

dynamo
donate
dynamite
dyspepsia

destiny
dabble
destroy
dinosaur

duck
Darwin
diction
duct

1. _____	5. _____	9. _____	13. _____
2. _____	6. _____	10. _____	14. _____
3. _____	7. _____	11. _____	15. _____
4. _____	8. _____	12. _____	16. _____

Answer these questions to show how well you can make use of guide words at the top of dictionary pages. Write *before* or *after* on the space following each question.

1. Does *jungle* come before or after the guide word *Jonathan*? _____
2. Does *India* come before or after the guide word *issue*? _____
3. Does *melon* come before or after the guide word *murmur*? _____
4. Does *abode* come before or after the guide word *abacus*? _____
5. Does *soccer* come before or after the guide word *scrape*? _____
6. Does *fiesta* come before or after the guide word *figment*? _____
7. Does *evaporate* come before or after the guide word *extent*? _____
8. Does *peer* come before or after the guide word *pet*? _____
9. Does *bazaar* come before or after the guide word *bay*? _____
10. Does *crouch* come before or after the guide word *crosswalk*? _____

USING AN INDEX IN TEXTBOOKS

Suppose that you became interested in rocks while reading about the rocks of the Bad Lands. Suppose further that you decided to find more information about rocks in the index of a *science* textbook.

Below you will find a page from the index of a *science* textbook.* Study it and answer the questions on the next page.

Most textbooks have an index. If you are looking for information in a textbook, you will save yourself a lot of time by using the index. You will also be able to find much more information through the use of the index. Usually not *all* information about a topic is given in any one chapter. Bits of information may be found here and there throughout the book, and only the index will tell you where.

- Rennet, 81
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 - River systems, 331-333
 - Rockets 10, 17
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 - Roots of plants, 54
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 - Sanforization, 239
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* Ames, Maurice, Arthur O. Baker, Joseph F. Leahy, *Science for Your Needs* (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1956), p. 361.

1. On what pages would you expect to find a general discussion of rocks? _____
2. How many subtopics are discussed under the general topic *Rocks*? _____
3. Are the subtopics listed in order of their importance? _____ In the order in which they appear in the book?

4. The authors had some plan in mind in listing the subtopics in a certain order. What do you think this plan was? _____
5. Write in order the first letter of the first word in each of the subtopics: _____, _____, _____, _____,
_____, _____, _____, _____, _____, _____, _____, _____, Are these letters in alphabetic order?

6. Is there any reason why *metamorphic* should come before *meteors*? _____ What is the reason?

7. If you were surprised to find *anthracite* listed under *Rocks*, where would you look to find out whether or not
anthracite is a rock? _____
8. You read about sedimentary rocks on page 93 of *Be A Better Reader*. If you wish to find out more about
sedimentary rocks in the science book, where will you look? _____
9. If you are interested in making a collection of rocks, where will you look? _____
10. After the subheading *meteors*, it says "see Meteors." Where would you look to "see Meteors"? _____

11. In the upper right-hand column you will find the general heading of *Salt*. Under this heading is the subhead-
ing *rock*. Do you think this heading is one you should look up if you were trying to find all information in the
book about rocks? _____ If you're not sure, how could you find out? _____
12. Look at the topic *Scientific method*. Write the first letter of each of the subtopics under this heading:

13. What plan was used in listing the topics under *Scientific method*? _____

Making Indexes of Your Own

Below you will find three main topics together with their subtopics and the pages on which they are discussed. The topics and subtopics are not arranged alphabetically. Arrange the topics and subtopics in alphabetical order, as they would appear in an index. Use a separate piece of paper.

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MAKING COMPARISONS

One of the skills which you need to use most often in *geography*, *history*, or *social studies* is that of comparison. This skill is often necessary in studying *science* and *mathematics*, also. In making comparisons you study two countries, two classes of plants or animals, two numbers or sets of numbers, or other topics to find how they are alike, or how they are different. Sometimes you examine two topics for the

purpose of finding out both their likenesses and their differences.

You may now practice using this important skill. Read each of the selections below. As you read the one on *Greenland*, think of the ways in which this country is like *Iceland* and the ways in which it is different from Iceland. When you have finished, make the comparisons asked for on page 101.

Iceland

Iceland is a small island in the North Atlantic Ocean. It is about midway between Norway and Greenland. Its northerly part touches the Arctic Circle, but the entire island lies below the Arctic Circle. The area of the island is 39,768 square miles.

The largest part of Iceland is a high plateau. This plateau is covered with glaciers in some places. In other places it is covered with snowfields or rock. None of it is of any use for growing crops or for anything else. All of the people in Iceland live on the lower lands along the shores of the sea.

A warm current of the Gulf Stream as a rule encircles the island. This makes the climate much milder than it might otherwise be. At Reykjavik the mean temperature in January, the coldest month, is 39.4 F. The mean temperature in July, the warmest month in that city, is 51.6 F.

Several kinds of mosses grow in Iceland. The most famous of these mosses is called *Iceland moss*. This moss is dried and used for making bread or eaten with milk. Heather covers large parts of Iceland and is used for pasture for sheep.

There is little in Iceland in the way of forest trees.

There are a few birches, a few mountain ash and some willows here and there. But forests as such are not found in Iceland.

There are several wild animals which now live in Iceland or in the waters that border it. Blue and white foxes are natives of Iceland. Reindeer, mice, and rats have been brought to the island and now live there in a wild state. Polar bears are seen occasionally. There are many seals and whales in the nearby waters. Many rivers abound in salmon, and trout are plentiful in the lakes and streams.

Farming is the chief occupation of the Icelanders. Fishing is next in order. Nearly all of the fishermen spend their time in catching codfish and herring.

There are no minerals in Iceland. Mountains are made of volcanic lava and contain no precious metals.

The products which Iceland has to export come largely from her fishing and farming industries. She exports fresh and cured fish, salted and spiced herring, cod-liver oil, and herring oil. The farm products which she exports are salted and fresh mutton, wool, hides, and sheepskins. A certain amount of cheese is also exported.

Greenland

Greenland is an island lying in the North Atlantic Ocean above the northeastern part of the United States. This is the largest island in the world. It has an area of 827,275 square miles. The greater part of this island lies above the Arctic Circle.

A great icecap covers the entire central part of Greenland. The area of this icecap is about 721,000 square miles. So you see, there is not too much space left where people can live. The only part that is inhabited is the land along the coast.

Since the island is so far north, the climate is very cold. The average temperature in January ranges from -30° in the north to 20° in the south. In July the average is 40° . The warm Gulf Stream causes the temperature to be warmest in the southwest of Greenland, on the coast.

In some parts of Greenland the ground is covered with a carpet of mosses. There are no forests on this

island. There are a few dwarf birch trees and willows here and there. Some kinds of vegetables will grow in the south, but farms as such do not exist.

The polar bear, the fox, the Arctic hare, and the ermine are natives of Greenland. The muskox, the reindeer, and the polar wolf have been brought in from America. Seals and whales abound in the surrounding waters. Sea-trout are found in the streams and lakes of the south.

The chief occupation of the people in Greenland is fishing. They also do some sealing. There is no farming, but there are several small mining regions. Some people work as miners in the copper, iron, coal, and cryolite mines.

Greenland's chief articles of export are seal oil; seal, fox, and bear skins; fish products; eider down; and minerals. Practically all of the food for the people has to be imported from other countries.

Each of the paragraphs in the selection on **Iceland** and the one on **Greenland** deals with one topic. Below you will find the name of the topic discussed in each of the different paragraphs.

The topic of the first paragraph in each selection is "Location and Area." Write the ways in which Iceland and Greenland are alike in location. Then write the ways in which the two countries are different in location and in area.

In the same way write the likeness and differences in regard to each of the other topics.

Location and Area

Likenesses: _____

Differences: _____

Surface

Likenesses: _____

Differences: _____

Climate

Likenesses: _____

Differences: _____

Vegetation

Likenesses: _____

Differences: _____

Preparing and Using Outline Forms of Your Own

Get a separate piece of paper. Make outline forms for likenesses and differences in regard to these three topics: **Animals, Occupations, Exports.**

Write the likenesses and differences of Iceland and Greenland under each of these topics.

UNIT EIGHT



TEEN-AGERS IN OTHER LANDS

Do you like jungle stories? In the story below two boys of India have a very exciting adventure with ravenous crocodiles. Find out if they escape.

The mass of leaves on a plant is called *foliage* (fō'li ij).

An animal craving food is said to be *ravenous* (rāv'ēn ūs).

To come near is to *approach* (ă prōch').

When a person is desperately moved he is said to be *frantic* (frăn'tik).

Beginning time: Hr. _____ Min. _____

CHASED BY CROCODILES

The golden sun of southern India slanted here and there between the thick, green foliage of jungle trees. The bamboo leaves rustled softly in the breeze. Bright-colored birds sang their jungle songs. A sluggish stream murmured pleasantly as it slowly moved along over its sandy bed.

Nana and his younger brother, Baber, should have been very happy. But they weren't. How could they be happy when there were no big fish to be caught?

The boys had been fishing for several hours. Three small fish were all that they had been able to catch. Nana dipped leaves in water and wrapped the fish in the wet leaves. People in Nana's town had no refrigerators, but Nana had learned other ways of keeping food from spoiling.

"I'm certainly getting tired of fishing with no luck," complained Baber. "Why is it that we can't catch at least one good-sized fish?"

"It must be this hot, dry weather," replied Nana. "It hasn't rained for a long time. The water in this stream is very shallow. Big fish like deep water. Probably they have gone to the great river. I guess we may as well go home."

Nana picked up his basket with the three small fish in it. After squeezing between the cane-like trunks of bamboo trees and struggling to free themselves from twisted vines and matted shrubs, they finally came to the clearing. Far off in the distance they could see a cluster of thatched roofs. This was the village where the boys lived.

Between the village and the forest there was nothing but cleared land with some crops growing—nothing except one small bamboo hut. Harsha, a strange old man, lived in this hut. He didn't like people so he preferred to live out in the clearing by himself. The boys caught glimpses of him now and then in his white turban and robe. When they passed too close to his hut, he would shake his fists or wave a stick threateningly at them.

They walked hurriedly on toward the village. They didn't feel at ease, and they wouldn't be entirely comfortable until they were well beyond old Harsha's hut.

As they approached a low hill Nana noticed a brown object at its crest. Was it a log? He looked sharply. No, it was moving! It began to creep down the side of the hill. Then another brown object appeared at the crest and started downward. Then another and another, then dozens more appeared like magic!

Nana stood stark still, blood frozen in his veins, unable to scream or speak. He knew that this was a herd of man-eating crocodiles. He had heard that they travelled overland in great numbers when the water holes in which they lived dried up. At such times they were starving for food and very dangerous.

Baber, noticing that Nana stood staring at the hill, looked in that direction, too. He was much younger than Nana but even a youngster in India could sense the danger of an approaching herd of crocodiles.

"Oh, Nana," he screamed. "What shall we do?"

The scream of his young brother brought Nana to

his senses. The crocodiles were very close when Nana frantically snatched the three small fish from his basket. He tossed them one by one into the moving mass of hungry beasts. For a moment they scrambled and fought to get the fish.

“Quick, Baber. Harsha’s hut!” cried Nana. The crocodiles, having eaten the fish, rushed on after the boys.

Nana glanced back. There they came. Dozens of open-mouthed, ravenous crocodiles following close on the boys’ heels!

Could they reach the old man’s hut before the crocodiles caught them? “Faster! Faster!” cried Nana.

The hut was very near now. But what if the old man wouldn’t let them in?

Suddenly the white-robed figure of Harsha appeared in his doorway. He had a gun. As he raised it to his shoulder the boys thought he was aiming it straight at them. But they dared not stop. On they ran with the herd of crocodiles behind them, the old man’s gun in front of them.

Suddenly shots rang out. Baber fainted. Nana grew weak and dizzy. Speedily the old man ran to them. “I killed two of them,” said he. “They’re scared now and running the other way like mad.” Harsha gathered Baber in his arms and carried him into the hut, as Nana followed. Cool water splashed on Baber’s face soon revived him.

Weak and exhausted after their frightening experience both boys sat on a mat in Harsha’s hut. “I know exactly what you need,” said Harsha. He disappeared but was back in a twinkling. In his hands was a huge melon. With a long knife he cut a generous piece for each boy.

As their teeth sank into the sweet red fruit, Baber was happy, and a great glow of gratitude swept over Nana. They were no longer afraid of Harsha. He seemed really to be a kind old man.

When the boys left they bowed low and thanked Harsha for saving their lives.

“It was nothing,” said Harsha. “Stop in again next time you pass by.”

Ending time: *Hr.* *Min.* *Sec.*
Beginning time: _____

No. words $\frac{865}{\text{No. seconds}} \times 60 = \text{_____ WPM}$

Find your rate in the usual way.

COMPREHENSION QUESTIONS

- 1. Where did this story take place? _____
- 2. Why were Nana and Baber unhappy at the beginning of the story? _____
- 3. Why did Nana wrap the fish in wet leaves? _____
- 4. What reason did Nana give for the fact that they couldn’t catch any big fish? _____
- 5. Why did Harsha live out in the clearing by himself? _____
- 6. What did Nana do first to stop the crocodiles from travelling? _____
- 7. Where did the boys run to get away from the crocodiles? _____
- 8. How did the old man get rid of the crocodiles? _____
- 9. What did Harsha do to help the boys recover from their fright? _____

- 10. What invitation did Harsha give to the boys at the end of the story? _____

Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

Write your answers on a separate piece of paper.

- 1. The first paragraph describes the setting in which this story took place. Describe the picture which you saw in your own words.
- 2. Compare the setting of this story with that in the story of “Lobo, the Malemute.” Give several ways in which the two settings are different.
- 3. What was the most frightening part of the story?
- 4. Nana knew some ways of keeping food from spoiling other than wrapping in wet leaves. What do you think some of these other ways were?
- 5. Why didn’t the boys feel at ease when they were near old Harsha’s hut?
- 6. What is the *crest* of a hill?
- 7. What is a *bamboo* hut? What is a *thatched* roof?
- 8. Why did the people in this story live in bamboo huts with *thatched* roofs?
- 9. How can you account for the change of Harsha’s attitude toward the boys?
- 10. What do you think might have happened in the old man’s life that caused him to dislike people?

TWO TEEN-AGERS IN DIFFERENT LANDS



Have you wondered how boys and girls of your own age live in other parts of the world? Suppose we visit Camilo and Irene to learn how two young teen-agers live in countries other than your own.

1. In reading this *social studies* selection, first glance quickly through the entire selection for the purpose of finding the topic or subject of each paragraph. The topic is different from the main idea. The topic is the subject or theme that each paragraph discusses. As soon as you find the topic of a paragraph, write it as a title of the paragraph. Write this title in one or two words on the line above the paragraph. No title is to be written for the first paragraph in either selection. The title for the second paragraph under "Camilo" is written for you.

2. After finding and writing the topic or subject of each paragraph, reread the selection carefully to find out all of the details about the topic discussed in each paragraph. You will be asked to outline some of the paragraphs.

The name of a lake 150 miles west of Mexico City is *Patzcuaro* (pätz'kü är'ō).

A very fine cheese made by the Dutch is called *Edam* (ē'dām) cheese.

An earth from which unbaked bricks are made is called *adobe* (à dō'bī).

The name for a kind of blanket worn as clothing in Latin America is *serape* (sè rä'pā).

One Spanish name for a boy is *Camilo* (kà mēl'ō).

The Mexicans eat a thin cornmeal cake which they call a *tortilla* (tôr tē'yä).

The Mexicans call a religious holiday a *fiesta* (fyēs'tä).

A form of football in which no one uses his hands or arms except the goalkeeper is called *soccer* (sök'er).

ALIKE, YET DIFFERENT *

CAMILO

1. Camilo is a 13-year-old Mexican Indian boy. He lives on an island in Lake Patzcuaro about 150 miles west of Mexico City.

Camilo's Home

2. Camilo's home is a one-room house built of adobe bricks. At night he sleeps on a woven mat spread on the floor. He covers himself with a bright blanket called a *serape*. On one side of the room is a beehive-shaped oven used by Camilo's mother and sisters for baking. Jugs on a shelf are used for storing water. On one wall hang copper kettles, cooking pots, and brightly painted pottery. A wooden chest is used for

storing clothing. Several fishing nets are hung to dry at one side of the room.

3. Like most boys of his age in this part of Mexico, Camilo wears white cotton trousers. A cotton shirt and a wide-brimmed straw hat are part of his everyday dress. Most of the time Camilo goes barefoot. In cool weather, he wears a *serape* over his shoulders, and straw sandals on his feet. When it rains, he puts on a cape made of palm leaves.

4. At almost every meal, Camilo's family eats *tortillas*. These are thin corn cakes baked by his mother or sisters. With the tortillas, Camilo usually has kid-

* Based upon an article prepared for this book by John Heine.

ney beans, and fish taken from the lake. The usual drink is a thin soup made from corn. The food is often spiced with chile peppers. Sometimes Camilo has onions, tomatoes, garlic, squash, sweet potatoes, or fresh fruit. Since meat is expensive, Camilo's family has meat only on holidays.

5. Camilo looks forward eagerly to fiestas. These are usually religious holidays, including saints' days. He and other boys in his village dress up and wear masks. The fiesta often has a parade, followed by dances in which groups of boys take part. At one of the fiestas, a contest is held in which men and boys try to ride a bull holding onto a strap.

IRENE

1. Irene's life is different from Camilo's in many ways. She lives in north Holland or the Netherlands. Irene goes to school, for the law requires that all boys and girls from 7 to 14 years of age must attend school. Her favorite subject is English, which she has been studying for several years.

2. Irene's home is built of brick, with a steeply sloping tile roof and brightly painted shutters. Most houses in the Netherlands are built of brick, tile, or concrete rather than wood, because most of the wood used in the Netherlands must be imported. The furni-

ture in Irene's home is simple and somewhat old-fashioned compared with that in American homes. Her mother, like most Dutch housewives, is a very careful housekeeper. Irene spends many hours helping her mother to keep the house spotlessly clean.

3. Irene's parents pride themselves on setting a good table. Many meals include dishes made from the famous Edam cheese which her father makes. Bread, butter, meat, potatoes, and fresh milk are usually served, also. Irene's family has a vegetable garden which helps keep them supplied. She is fond of herring and other fish which her mother buys at the weekly market in a nearby town. Irene often helps her mother to bake cookies or to make preserves which are served as dessert.

4. Like most Netherlandsers, Irene enjoys riding her bicycle along the brick roads near her home. Few people own automobiles, so the bicycle is the most common form of transportation in Irene's country. When the weather is cold, Irene likes to go on skating parties with other girls and boys her age on one of the many nearby canals. In summer she often goes swimming at a beach a few miles from her home. Sometimes Irene goes to watch her brother play his favorite game, soccer, with the boys from his school.

ACTIVITY 1—OUTLINING PARAGRAPHS

Outline the paragraph called for below. First write the topic of the paragraph which you wrote on a line above the paragraph in the article. Then list the details which tell more about that topic. Use as few words as possible in naming these details. The first outline is partly done for you.

When you have finished outlining this paragraph, get a separate piece of paper and outline these paragraphs: No. 5 under "Camilo"; No. 3 under "Irene"; No. 4 under "Irene."

Second Paragraph Under "Camilo"

II. Camilo's Home

- A. One-room adobe brick
- B. Sleeps on mat on floor
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____

HOW FOOD IS PRESERVED

In the story about Nana and Baber, you read that Nana wrapped his fish in wet leaves to keep them fresh. Do you think the wet leaves would keep the fish fresh for very long in that jungle country? And why would wet leaves have any effect on the fish at all? Why do refrigerators in our homes keep food from spoiling? The selection below will answer these questions.

In this selection you will find several different patterns of material. The four different sections of the selection are marked with subheads in *italics*. In the first section, you are given information in the form of facts. In each of the second and third sections a conclusion is stated and then you are told how to prove this conclusion by carrying out an experiment. In the fourth section a process is explained. You need to have different purposes in mind in reading these different patterns of materials, and you need to use different procedures in terms of your purposes.

1. Noting that the first section states facts, read this section for the purpose of finding out what these

different facts are. Clearly recognize each fact separately, and think about it carefully.

2. In reading the second section, first find and underline the main idea. Then read the directions for the experiment for the purpose of proving this idea. Read these directions one at a time, and make sure that you understand exactly what you should do in carrying out each direction. After reading all the directions for the experiment, turn your head away from the book and see if you can tell yourself exactly what to do in carrying out the experiment.

3. Read the third section for the same purposes and in the same way that you read the second one.

4. Read the fourth section for the purpose of understanding a process. Use the same procedure that you used in reading how the telegraph works. Read one step in the process, think about it, look at the diagram and visualize what happens, then read the next step in the same way, and so on.

After reading the entire process, number the steps right in the text of the paragraph. See if you can repeat them to yourself in order.

When we keep food fresh, we are said to *preserve* (prě zûrv') it.

A self-acting machine is said to be *automatic* (ô'tô măt'ik).

One of the enclosed parts within a closed space is called a *compartment* (kôm pärt'měnt).

A kind of gas used in a refrigerator is called *Freon* (frě'ôn) gas.

When a person presses something together he is said to *compress* (kôm prěs') it.

A certain method of going ahead with a course of action is called a *procedure* (prô sê'dûr).

REFRIGERATION *

Methods of preserving food. Man has learned several different ways of preserving food. In primitive days he had to kill animals practically every day in the warm season in order to have fresh meat. As the years went by, he learned to preserve meat by salting it and drying it in the sun. Pioneer women cooked fruit and vegetables and canned them in air-tight jars. Finally it was discovered that food would stay fresh longer if it were kept in a cool cellar.

Refrigeration as a means of preserving food. Refrigeration is an excellent way of preserving food. All methods of preserving food are based on the idea of killing bacteria or keeping bacteria from multiplying. Most bacteria cannot grow in low temperatures. So the cooling process known as refrigeration is used more generally than any other in preserving food at the present time.

A simple experiment can be done at home to prove that refrigeration preserves food. You will need two

small pieces of raw meat, two small scoops of cottage cheese, and two half-glasses of milk. Keep one set of each of these three foods, uncovered, in the refrigerator. Keep the other set, uncovered, on a shelf in the kitchen. Observe the foods each day for about a week. You will notice definite evidence of spoiling of the foods that are not refrigerated. Color, odor, and mold will tell the story.

Producing a cooling effect. Whenever a liquid changes to vapor there is a cooling effect. That is why your wet skin will feel cool as it dries in the air. Also your perspiring face feels cool when you fan it. The change from liquid to gas takes up heat. To test this cooling effect, wrap a wet cloth around the bulb of a thermometer. Read the temperature after a few minutes. Check by reading the temperature of the air with a dry thermometer. The wet thermometer will have a cooler reading. The evaporating water takes heat away from the nearby air and the bulb of the thermometer. If alcohol is used instead of water to wet the cloth, the difference in the thermometer readings

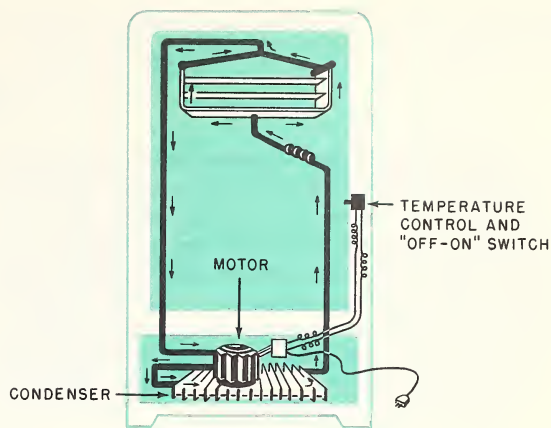
* Based upon material prepared for this book by Maurice U. Ames.

is greater, because alcohol evaporates faster.

How a refrigerator works. All refrigerators depend upon the cooling effect of evaporation. A gas called *Freon* is the most commonly used gas in refrigerators. An electric motor, located at the bottom of the refrigerator, compresses the gas. The compressed gas is cooled by the air around it. The cooled, compressed gas then condenses to a liquid in the condenser.

The liquid Freon is then pumped up into the upper part of the refrigerator. There in the pipes of the freezing compartment the liquid Freon evaporates. This evaporation absorbs heat from surrounding objects and produces the cooling effect in the upper pipes. Then the Freon in the form of a gas flows down to the electric motor and pump which again compress it. It then condenses to the liquid state.

This change from liquid to gas and then from gas to liquid goes on until the temperature in the refrigerator is low enough. An automatic switch can turn the elec-



tricity for the refrigerator off when the temperature is below a certain set point and can turn it on when the temperature is above this point. A dial in the refrigerator enables you to choose temperatures.

ACTIVITY 1—RECALLING FACTS

Name the important facts that were given in the first section of the article:

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| _____ | 4. _____ |
| 2. _____ | _____ |

ACTIVITY 2—MAIN IDEA AND PROOF

State the main idea of the second section, then tell exactly how you could prove this main idea.

Main idea: _____

Proof: _____

ACTIVITY 3—TELLING HOW A REFRIGERATOR WORKS

Write the steps in the process of cooling air in a refrigerator.

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | _____ |
| _____ | 6. _____ |
| 3. _____ | _____ |
| 4. _____ | 7. _____ |
| _____ | _____ |

READING ALGEBRAIC EQUATIONS

In learning to read equations you are learning to read a new language. This new language is not French or German. It is the language of *algebra*. Letter symbols are used in *algebra* to stand for numbers. Your success in working with algebraic equations depends upon your ability to read, translate and interpret these letter symbols. You need to know how to read and translate symbol statements into word statements, and how to read and translate word statements into symbol statements.

You need also to know what an equation is. The word *equation* comes from the word *equal*. You will always find an *equal* sign ($=$) in an *equation*. The quantity on one side of the equal sign always equals the quantity on the other side. An equation, then, is a statement that one quantity equals another.

In *algebra* there is always a missing number in an equation. This number is represented by N or some other letter.

This is how we might write an addition equation in *arithmetic*:

$$? + 3 = 12$$

This is how we would write a multiplication equation in *arithmetic*:

$$5 \times ? = 30$$

When division is used in an *arithmetic* equation it is written like this:

$$? \div 8 = 3$$

When a fraction is used, this is the way an equation might be written in *arithmetic*:

$$\frac{1}{2} \text{ of } ? = 8$$

This is how we would write this equation in *algebra*:

$$N + 3 = 12$$

This is how we would write the same equation in *algebra*:

$$5N = 30$$

This is the way the same equation would be written in *algebra*:

$$\frac{N}{8} = 3$$

This is the way the same equation would be written in *algebra*:

$$\frac{1}{2}N = 8, \text{ or } \frac{N}{2} = 8$$

Translating Equations into Word Statements

Write each of the equations below in a word statement. The first one is done for you.

1. $N + 5 = 15$

Word statement: A number plus 5 equals 15.

2. $N + 12 = 24$

Word statement: _____

3. $B - 8 = 6$

Word statement: _____

4. $B - 7 = 14$

Word statement: _____

5. $\frac{1}{3}C = 5$

Word statement: _____

6. $3d = 36$

Word statement: _____

7. $\frac{1}{2}C = 20$

Word statement: _____

8. $\frac{N}{9} = 3$

Word statement: _____

9. $\frac{d}{6} = 12$

Word statement: _____

10. $7f = 63$

Word statement: _____

Translating Word Statements into Equations

Write an equation as it would be written in *algebra* for each of these word statements. The first one is done for you.

1. Statement: A certain number increased by 23 becomes 43.

Equation: $N + 23 = 43$

2. Statement: A certain number increased by 12 becomes 36.

Equation: _____

3. A certain number decreased by 9 becomes 18.

Equation: _____

4. Five times a certain number is 45.

Equation: _____

5. If a number is divided by 7, the quotient is 4.

Equation: _____

6. Three times a number decreased by 10 is 20.

Equation: _____

7. One third of a number is 12.

Equation: _____

8. One half of a number is 21.

Equation: _____

9. A certain number increased by 26 becomes 46.

Equation: _____

10. One third of a number is 27.

Equation: _____

11. Twice a number decreased by 4 equals 18.

Equation: _____

12. One half of a certain number is 35.

Equation: _____

13. If 9 is subtracted from a number the answer is 28.

Equation: _____

Writing Equations for Problems *

Examples

These examples will explain how to write an algebraic equation for problems.

1. Baber is 2 years younger than Nana, who is 14.

Let B represent Baber's age. If Baber's age were increased by two years, he would be the same age as

Nana. Baber's age increased by two years can be expressed algebraically as $B + 2$. Therefore, the equation is:

$$B + 2 = 14$$

2. Irene has a ten-year-old brother named Henry. In six more years, Irene's age will be twice the present age of her brother.

Let I represent Irene's present age. In six more years she will be $I + 6$ years old. At that time her age will equal twice that of her ten-year-old brother's present age, or $2 \times 10 = 20$. Thus the equation is:

$$I + 6 = 2 \times 10$$

$$\text{or } I + 6 = 20$$

PROBLEMS

See if you can write an algebraic equation for use in solving each of the problems below. There will be one unknown number which you are to represent with a letter in each problem. Read carefully to decide what process to use in finding the missing number.

After making this decision, write your equation. Then find the answer to the problem.

1. If Camilo were 7 years older, he would be the same age as his sister, who is 21. How old is Camilo?

Equation: _____ Answer: _____

2. Twice Henry's weight is 4 pounds more than 200. What does Henry weigh?

Equation: _____ Answer: _____

3. When 6 is added to half of Camilo's uncle's age, the sum is 20. How old is he?

Equation: _____ Answer: _____

4. Baber weighs $\frac{4}{5}$ as much as Nana; together they weigh 144 pounds. How much does Nana weigh?

Equation: _____ Answer: _____

5. Two thirds of the old fisherman's catch one day was 3 more than half that catch. What was the catch?

Equation: _____ Answer: _____

Applying What You Have Learned About Reading Algebraic Equations

You have been working with a new language—the language of *algebra*. When you find it necessary to do problems based on algebraic equations, remember that a large part of your work has to do with the use you make of this new language.

In your beginning work in solving problems with algebraic symbols, you may find it helpful to do some

of the things which you did in working with these two pages:

1. Read the problem very carefully and decide upon the process that would have to be used in finding the missing number.
2. Write the equation as a word statement.
3. Translate the word statement into an algebraic equation.
4. Solve the equation.

* Based upon material prepared for this book by Francis J. Mueller.

REVIEWING PREFIXES AND SUFFIXES

Among the suffixes that you have had, the ones which you meet most often are ion, tion, ation. All three of these suffixes mean about the same thing: act of, result of, or state of. The suffixes ion and tion nearly always are pronounced as if they were spelled shun. The suffix ation is pronounced ā shŭn.

Add one of these suffixes to each word below to make a new word. If the word ends with e cross out the e before adding the suffix.

ion	tion	ation
-----	------	-------

- | | | |
|--------------------|-------------------|----------------------|
| 1. suggest _____ | 4. inform _____ | 7. celebrate _____ |
| 2. convene _____ | 5. generate _____ | 8. reproduce _____ |
| 3. evaporate _____ | 6. examine _____ | 9. refrigerate _____ |

In the boxes below you will find prefixes which you have had. Write a prefix in the blank space at the left of each word to make the word mean the same thing as the phrase to the right of the word.

un	mis	out	under	over	trans	re	dis
----	-----	-----	-------	------	-------	----	-----

- | | |
|-------------------------------------|-------------------------------------|
| 1. _____ state: to state again | 6. _____ reach: to reach too far |
| 2. _____ common: not common | 7. _____ count: a wrong count |
| 3. _____ port: to carry across | 8. _____ produce: to produce again |
| 4. _____ courage: to lessen courage | 9. _____ ripe: not ripe enough |
| 5. _____ eat: to eat too much | 10. _____ present: to present again |

Add one of the suffixes in the box below to each of the words that follow. Be sure to add the suffix to the word which will give it the meaning of the phrase to the right of the word.

er	ist	ful	en	ly	less	ness	ment
----	-----	-----	----	----	------	------	------

- | | |
|---|--|
| 1. regard _____ : without regard | 7. help _____ : full of help |
| 2. govern _____ : the system by which a country is governed | 8. improve _____ : the act of being improved |
| 3. steam _____ : a boat run by the power of steam | 9. sweet _____ : the quality of being sweet |
| 4. state _____ : the act of stating | 10. proud _____ : with pride |
| 5. help _____ : without help | 11. quick _____ : in a quick way |
| 6. wood _____ : made of wood | 12. alarm _____ : one who alarms |

Finding Root Words, Prefixes, and Suffixes

Draw one line under the root word in each of the words below, two lines under each prefix, and three lines under each suffix. The first word has been marked for you.

- | | | | |
|-----------------------------|-------------|---------------|-------------------|
| 1. <u>favor</u> <u>able</u> | 3. imprison | 5. fingerling | 7. allowance |
| 2. resource | 4. dictator | 6. skillful | 8. disappointment |

Using Prefixed and Suffixed Words in Sentences

On a separate piece of paper write a sentence containing each of the words on this page which you made by adding a prefix or a suffix.

WORKING WITH SYNONYMS

Words that are similar in meaning are called *synonyms*. On this page you are to find synonyms for words.

In each of the groups below there is one key word and blank spaces for three additional words. You are to write the three additional words. These words must be somewhat like the key word in meaning.

1. primary _____

2. admire _____

3. amusement _____

4. remarkable _____

5. endure _____

6. unknown _____

7. strive _____

8. sturdy _____

9. demand _____

bear
recreation
favorable
wonderful
smart
employment
stoop
first
fashion
approve
strong
ask
distinct

try
lucky
reduce
entertainment
consent
withstand
press
bend
struggle
skillful
work
request
frantic
plain

Choose these words from the lists at the bottom of the page.

After you have written the correct words on all of the lines, write on a separate piece of paper a sentence containing each key word. After the key word in the sentence, place in parentheses any of the other three words that could be used just as well.

10. custom _____

11. fortunate _____

12. occupation _____

13. permission _____

14. clever _____

15. crouch _____

16. compress _____

17. clear _____

18. violent _____

unfamiliar
style
extraordinary
cringe
permit
undergo
condense
earliest
game
unexplained
noteworthy
robust
evident
frenzied

strange
business
quick-witted
leave
prime
manner
esteem
honor
toil
successful
require
vigorous
furious

WORKING WITH ANTONYMS

Antonyms are words that are opposite in meaning.

Below you will find two lists of words. To the right of each word there is a line. On this line you are to write a word that is opposite in meaning to the printed word at the left. You will find the right word to write on each line in the lists of words at the bottom of the page.

After you have written words on all of the lines, see if you can write a sentence containing each word. You will need to write your sentences on a separate piece of paper.

- | | |
|---------------------|-----------------------|
| 1. similar _____ | 19. abrupt _____ |
| 2. profit _____ | 20. simple _____ |
| 3. expand _____ | 21. mental _____ |
| 4. recent _____ | 22. liquid _____ |
| 5. permanent _____ | 23. approximate _____ |
| 6. release _____ | 24. shortened _____ |
| 7. success _____ | 25. mountain _____ |
| 8. majority _____ | 26. import _____ |
| 9. demand _____ | 27. many _____ |
| 10. brief _____ | 28. fresh _____ |
| 11. mild _____ | 29. generous _____ |
| 12. synonym _____ | 30. innocent _____ |
| 13. rear _____ | 31. separate _____ |
| 14. liability _____ | 32. desert _____ |
| 15. powerful _____ | 33. brave _____ |
| 16. confirm _____ | 34. prefix _____ |
| 17. frigid _____ | 35. fact _____ |
| 18. worthless _____ | 36. fierce _____ |

confine

exact

contract

harsh

few

temporary

together

gradual

stale

failure

cowardly

complex

front

export

gentle

canyon

loss

reject

fancy

valuable

lengthy

suffix

old

solid

minority

stingy

swamp

deny

guilty

lengthened

weak

antonym

physical

different

asset

torrid

WORKING WITH WORDS OF MULTIPLE MEANINGS

Some words have different meanings in different subject fields. You will find words of this type in the list below.

Read the first definition. Choose a word from the list that goes with that definition. Do the rest of the page in the same way.

solution
ruler
graft
capital

mill
margin
court
volume

order
settlement
period
current

revolution
acute
subject

- | | |
|--|--|
| <p>1. _____ In <i>history</i>: one who governs a country</p> <p>2. _____ In <i>arithmetic</i>: a flat, narrow strip used in measuring or drawing lines</p> <p>3. _____ In <i>social studies</i>: a machine by which grain is ground for food</p> <p>4. _____ In <i>arithmetic</i>: a tenth part of a cent</p> <p>5. _____ In <i>science</i>: a mixture, usually liquid, formed by dissolving a substance into another</p> <p>6. _____ In <i>arithmetic</i>: the process or result of finding the answer to a problem</p> <p>7. _____ In <i>history</i>: an area of country newly occupied by those who intend to live there</p> <p>8. _____ In <i>arithmetic</i>: payment of an account</p> <p>9. _____ In <i>English</i>: a punctuation mark placed at the end of a declarative sentence</p> <p>10. _____ In <i>history</i>: a division of time dominated by one characteristic, as <i>Roman period</i></p> <p>11. _____ In <i>science</i>: the movement of electricity as it flows through wires</p> <p>12. _____ In <i>history</i>: belonging to the immediate present</p> <p>13. _____ In <i>English</i>: the noun, phrase, clause, or sentence setting forth the thing spoken about</p> <p>14. _____ In <i>history</i>: one who is under the governing power of a certain country</p> <p>15. _____ In <i>social studies</i>: an official group legally met together to administer justice</p> | <p>16. _____ In <i>literature</i>: attention directed toward a person to gain favor, to woo</p> <p>17. _____ In <i>history</i>: a command</p> <p>18. _____ In <i>arithmetic</i>: a written instruction to buy something</p> <p>19. _____ In <i>literature</i>: a book</p> <p>20. _____ In <i>arithmetic</i>: space occupied, as measured by cubic units</p> <p>21. _____ In <i>arithmetic</i>: of an angle, less than 90 degrees</p> <p>22. _____ In <i>literature</i>: keen, shrewd</p> <p>23. _____ In <i>history</i>: a sudden change in the form of government</p> <p>24. _____ In <i>science</i>: the complete cycle of a moving body that comes back to its starting place</p> <p>25. _____ In <i>English</i>: the blank space surrounding the writing or print on a sheet of paper</p> <p>26. _____ In <i>arithmetic</i>: the difference between the first cost and the selling price</p> <p>27. _____ In <i>social studies</i>: profit by unfair means</p> <p>28. _____ In <i>science</i>: a shoot inserted into a tree so as to live and become a part of it</p> <p>29. _____ In <i>social studies</i>: a city or town which is the seat of government</p> <p>30. _____ In <i>arithmetic</i>: the amount of money used in operating a business</p> <p>31. _____ In <i>English</i>: a large letter used at the beginning of a sentence or of a proper name</p> |
|--|--|

CHOOSING THE RIGHT DEFINITION

Sometimes two or more definitions are given for a word in the dictionary. When you look up a word you should read all of the definitions and pick out the one that best fits the meaning of the word in the sentence which you are reading.

Below are some words which you will find in Unit Nine. Three or more definitions are given for each of these words. Read the sentences on the right side

bond (1) That which binds; a band; tie. (2) Fetters; captivity. (3) An obligation or constraint. (4) An obligation in writing under a seal. (5) An interest-bearing debt certificate. (6) Bail, a surety.

cell (1) A small, close room, as for a prisoner. (2) A small case or cavity, as those bounded by the veins. (3) One of the ventricular cavities in the brain. (4) The room occupied by a monk or nun. (5) The smallest unit of which living things are made.

clue (1) A guide to solving a problem. (2) A lower corner of a sail, or a corner loop. (3) A ball of yarn, thread, or the like.

creek (1) A small inlet or bay, deeper and narrower than a cove; a recess in a shore of the sea or of a river. (2) A tidal or valley stream, between a brook and a river in size. (3) A small port or harbor. (4) A winding, narrow bend.

flip (1) To snap off; hence, to toss carelessly. (2) To strike with a slight quick motion. (3) To flap, flounce about. (4) To snap jerkily.

press (1) A dense throng. (2) The act of crowding together. (3) Hurry or pressure of affairs. (4) A case in which books or clothes are kept. (5) A machine by which pressure is applied. (6) Newspapers or periodical literature collectively. (7) The art, process, or business of printing.

rapid (1) Having great speed. (2) Bearing the marks of or characterized by rapidity. (3) Done or completed in a short time. (4) A descent in a river less abrupt than a waterfall, usually in the plural, *rapids*.

rear (1) To lift up or raise. (2) To build up, erect. (3) To bring up, to nurture and train, to breed.

of the page. Choose one of the words to write in the blank space in each sentence. After you have written the word, write above it the number of the definition of the word which best fits into the meaning of that particular sentence. The first sentence is completed for you.

In some of the sentences you will need to add an s to the word you write to make it plural.

1. Jane saw a small fish ³*flip* about in the shallow water.

Hal saw his father _____ a dead spider from the wall.

2. The prisoner was never allowed to go out of his _____.

You are going to read about a simple animal that has just one _____.

3. In the next unit you will also read how salmon _____ their young.

As Jane looked at the stream she saw a huge turtle _____ its head.

4. In America we can say what we like in newspapers. We have freedom of the _____. Jane hung all of her clothes in her own clothes-_____.

5. Sometimes the fingerprints of a burglar offer a _____ that will help you to track down the criminal. Mrs. Brown always kept her yarn in a tight _____ while knitting.

6. In the first story in Unit Nine you will read about a stream that was smaller than a river but larger than a brook. It is Salmon _____. A small bay on the shore of a sea is sometimes called a _____.

7. Mr. Mason invested his son's money in a government _____. It was thought that John Black had stolen some money. He gave a _____ of \$1,000 to keep from going to jail until his trial.

8. Hal did a _____ job in piling wood. Salmon sometimes swim against swift _____ in rivers.

FINDING THINGS IN A LIBRARY

Finding the Right Drawer in a Card Catalog

The cards upon which references are written in a library are kept in drawers. All of the drawers together make up what is called the *card catalog*. When you go into a library that has 60 or 70 drawers it may be a little difficult to find the right drawer for the topic you have in mind. It will save you time

if you learn to locate the drawer you want at one swift glance. Glance at the letters on the drawers in the same way that you glance at guide words in the dictionary until you find the right arrangement.

In one library the first seven drawers are lettered like this:

Drawer 1 A-ANA	Drawer 2 ANB-ATO	Drawer 3 ATT-BAY	Drawer 4 BEA-BRA	Drawer 5 BRE-CAL	Drawer 6 CAM-CLO	Drawer 7 CLU-DAI
-------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------

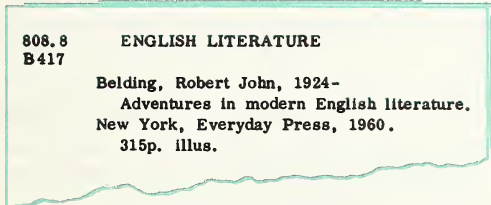
Write the number of the drawer in which you would find each of the following:

- | | | | |
|----------------------------|-------|---------------------------------------|-------|
| 1. Confederation of Canada | _____ | 4. A book by Louisa May Alcott | _____ |
| 2. Coulees of Canada | _____ | 5. A book on California | _____ |
| 3. Alexander Bell | _____ | 6. <i>Arachne, The Skilled Weaver</i> | _____ |

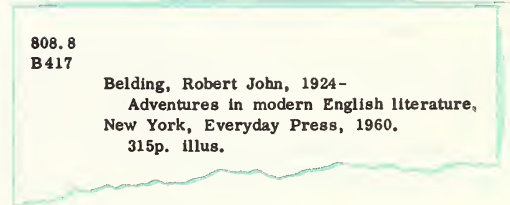
Reading Cards in the Card Catalog

As you probably know there are two, sometimes more, cards for each reference. The *subject card* gives the name of the *subject* first, and the *author card* gives the name of the *author* first. The subject

card is filed alphabetically according to the first main word of the subject. The author card is filed alphabetically according to the last name of the author.



Subject Card



Author Card

Write information as it would appear on a subject card for each of the books below. Use a separate piece of paper.

1. *The Story of Mining*, by Arnold Tyler, published by Blake Co., 1960.
2. *Learning to Paint*, by Alice K. Danvers, published by Rowan Press, 1955.
3. *The Life of Daniel Boone*, by J. Laswell, published by Vicker House, 1958.

Now write information as it would appear on an author card for each of the books above. Use a separate piece of paper.

TAKING NOTES ON AN ENCYCLOPEDIA ARTICLE

In reading the story about India, "Chased by Crocodiles," you were told that old Harsha lived in a "small bamboo hut." Let us suppose that you became interested in *bamboo* and wondered how a house could be made of this material. Suppose further that your teacher suggested that you look up *bamboo* in an encyclopedia and prepare to give a report to the class.

Below is an article on bamboo which appears in an encyclopedia.* Read it and take notes which you might use in making an oral report.

First, glance through the article to find with what topic each paragraph deals. Write the topic of each paragraph in your notebook, leaving plenty of space

under each topic for details. Number each paragraph topic with a Roman numeral. Use capital letters for the details.

Next read the details in each paragraph. Jot these details down under the topic of the paragraph. Use just as few words as possible—only enough to remind you of the information when you want to tell it to others.

At the bottom of the page, notes have been made on the first paragraph as an example to you. And the second paragraph has been started for you. Copy these notes in your notebook. Change the wording if you think of a wording that will serve you better.

BAMBOO. The colossal treelike grass called bamboo has been well styled "one of the most wonderful and most beautiful productions of the tropics, and one of Nature's most valuable gifts to man." It is a gift, with which Nature is generous; for nearly 500 species grow in Asia; in South, Central, and North America; and in Africa. Asiatic varieties have been imported by Europe and the United States, since the bamboo also flourishes in temperate zones.

A single root may grow as many as 100 polished jointed stems rising 30, 50, or even 120 feet. Branches are numerous toward the top. Flowers and seeds are produced yearly by some kinds, while others bloom only once in 50 or 100 years. The bamboo stem is sometimes three feet around. Young sprouts grow fast, at times a foot and a half daily.

The canebrakes of the southern United States are a variety of this evergreen grass native to this country. To keep out pests, the government has since 1919 banned importation of living bamboos or seed, except by the Department of Agriculture.

Bamboo provides man with everything from a delicious meal to a house. Probably you have eaten bamboo sprouts in chop suey. The Orientals serve the sprouts like asparagus, or candy, or pickle them. Some bamboos have a grain, like barley, used as food in China and India. A Chinese proverb says that the bamboo seed is more plentiful when the rice crop fails.

The hollow bamboo stem is used for posts of houses. Split into strips it forms the planks for floors, roofs, and sides. Besides the familiar fishing-rod, it is also used for waterpipes, bridges, and cables, and the joints of the large stems are even used for pails and for cooking utensils. Strips are woven into mats, chairs, beds, cradles, cages, porch curtains, and other articles of furniture. Chop sticks, hairpins, phonograph needles, and the ribs of fans are made of bamboo, and from the interior portions, beaten into a pulp, is made a fine variety of paper. The outer skin of some species is so hard that native knives and swords have been made from it, with a sharp and durable cutting edge.

So you see the bamboo is a very useful plant.*

Suggested Notes on the First Two Paragraphs

- I. Colossal treelike grass; valuable gift of Nature.
 - A. 500 species
 - B. Grows in Asia, Americas, Africa
 - C. Imported from Asia to Europe and U.S.
- II. Growth
 - A. 1 root, 100 stems, 30-120 ft. high
 - B.
 - C.
 - D.

Take notes on the other paragraphs by yourself. When you have finished taking notes, use them.

Give a report on bamboo to your class or to someone at home. See how well your notes work. If they don't help you to recall certain information, study them to find what the trouble was. Try to improve your note-taking next time.

* Reprinted from *Compton's Pictured Encyclopedia*, 1957 Edition. Copyright by F. E. Compton & Co., Chicago.

SELECTING SOURCES OF INFORMATION

You have learned how to find information in textbooks, the dictionary, encyclopedias, and the card catalog. You have also learned to use maps to find certain kinds of information. You know where to look for certain things in those newspapers and magazines that you read regularly. And you should be familiar with the use of the globe.

You may or may not have made use of an atlas. An atlas is a book made up entirely of maps. If you wish to find the location of a city, country, river, or mountain range, an atlas offers you a quick and handy reference.

Have you used the *Reader's Guide to Periodical Literature*? This guide is published each month. It contains references to articles appearing in maga-

zines, yearbooks, and other publications which come off the press at regular periods of time. The references are arranged by subjects and also by authors. If you wish to look up the latest articles which have been published in magazines, then the *Reader's Guide to Periodical Literature* is the place to look.

Have you read any books of *biography*? A book of biography gives you the most complete information that you can find about the life of a famous person. A biography of George Washington would give you more details about Washington's life than you could find in any other kind of reference.

Read each of the questions below. Find the right answer. Place a check mark before the letter of the answer which you think is correct.

1. Where would you find a short but complete statement of facts about the government of New Mexico?
 - a. a *science* book
 - b. a magazine story
 - c. an encyclopedia
 - d. an atlas
2. In which of these would you find how to divide the word *biography* into syllables?
 - a. *Reader's Guide to Periodical Literature*
 - b. the biography of a famous man
 - c. an encyclopedia
 - d. a dictionary
3. In which of these would you find the most complete account of the first transcontinental railroad?
 - a. a dictionary
 - b. a geography
 - c. an encyclopedia
 - d. a newspaper
4. If you knew the route of the transcontinental railroad, what would the best reference be to use in tracing the route on maps?
 - a. a globe
 - b. a weekly newsmagazine
 - c. an atlas
 - d. a *citizenship* book
5. What would be the best place to look to find out about the latest flights of jet planes?
 - a. a *social studies* book
 - b. a *science* book
 - c. an encyclopedia
 - d. *Reader's Guide to Periodical Literature*
6. Where would you be apt to find the most facts about the life of Louis Riel?
 - a. an encyclopedia
 - b. a *social studies* book
 - c. a biography of Louis Riel
 - d. a dictionary
7. Where would be the best place to find the name of the author of *Heidi*?
 - a. a dictionary
 - b. a card file
 - c. an encyclopedia
 - d. a *history* book
8. The best place to look to find the exact shape of Africa is
 - a. an atlas
 - b. a *social studies* book
 - c. a *science* book
 - d. a globe
9. The best place to look to find an account of Confederation is:
 - a. a *science* book
 - b. *Reader's Guide to Periodical Literature*
 - c. a *history* book
 - d. a biography of John A. Macdonald
10. The best place to look to find how a one-celled animal reproduces is
 - a. a dictionary
 - b. a *social studies* book
 - c. a *literature* book
 - d. a *science* book
11. Where would you look to find information about rubber?
 - a. an atlas
 - b. a biography
 - c. an encyclopedia
 - d. a *history* book
12. Where would you find the latest information on man-made satellites?
 - a. a dictionary
 - b. an encyclopedia
 - c. *Reader's Guide to Periodical Literature*
 - d. a *citizenship* book

UNIT NINE



DEMOCRACY BEGINS AT HOME

The story below happened in wartime. Our country needed a great deal of money to carry on the war. Everyone was urged to show his love for his country by buying government bonds. The boys and girls in this story were greatly disappointed when their family decided to buy war bonds instead of going on a trip which the children wanted very much to take. Read the story to find out how these boys and girls took their disappointment, and what they did in place of the trip.

A group of people asked to consider some action is called a *committee* (kō mīt'ī).

An observance of a religious, patriotic, or social occasion is called a *celebration* (sēl'ē brā'shūn).

A person who flees for safety or refuge in time of war, persecution, or disaster is called a *refugee* (rēf'yū jē).

Fish no longer than a finger are called *fingerlings* (fing'gēr lingz).

A channel carrying swift water used for floating logs is called a *flume* (flōōm).

When a person's clothing is soaked with water, he is said to be *drenched* (drēncht).

FREEDOM COMES AGAIN*

Beginning time: Hr.____Min.____

When he heard the kitchen screen door slam and saw Jane's fair hair flashing between the raspberry bushes, Hal Mason decided it was time to take a breather. For over an hour he had been piling wood in the back yard.

The Masons had planned a trip to Vancouver over the first of July. There was to be a big parade with Army and Navy bands, and real Army tanks. Hal could hardly wait!

"Dad wants to talk something over with us before he buys our train tickets," Jane told him. Hal walked to the house very slowly. Sometimes he wished that his father were a dictator like Jimmy Black's father. He always decided everything for the whole Black family. But when Hal's father wanted to "talk something over" it meant that the Mason family was called together to decide on some question or problem. "Democracy begins at home" he would always say at the beginning of a family meeting.

"Before we spend the fifty dollars our trip will cost," Hal's father said, "here's something we must think about hard." He read them a letter from the War Savings Committee, asking people to spend less on themselves and buy more War Bonds.

"Canada needs all hands at the oars," the letter ended. "Are YOU pulling your weight?"

"Dad, I wish you'd decide for us," Hal said.

"I thought you were against dictators," his father smiled. "No, son. We're going to take a family vote."

Of course they all voted to give up the trip and spend the money for buying War Bonds.

Jane suggested having a picnic on the First. Carl and Rose Hartz, refugee children from Austria, were staying at the Mason home. Jane wanted them to know what our First of July celebration was for. She especially wanted to do something which would make the day stand out to them.

Hal took a walk out by Salmon Creek. As he was passing over the bridge he stopped to watch the salmon fingerlings in the stream below. Salmon Creek was

* Evans, Hubert, "Freedom Comes Again," *Child Life*, July 1942. Adapted with permission of the author.

not so large as the great salmon rivers. But it was a rearing ground for salmon. Last year thousands of eggs had been left there by parent fish.

As Hal was standing on the bridge Jimmy Black came along.

"The Army's putting on parachute jumps at Vancouver tomorrow," Jimmy said. Hal told his news.

"I can hardly believe you voted to stay home," Jimmy replied. "I've got to hurry. We're going on the night train. Dad told me to shut the gate to the storage dam. He's closed the mill till Monday, so they won't need any water to bring logs in for sawing till we get back."

Next morning Hal couldn't get the bands and parachute jumps out of his mind. But as he and the other children were going to the picnic he caught something of the spirit of the day. Jane and Rose and Carl were thrilled to be celebrating this great day, even with a picnic near home.

As they neared the creek, Hal called, "Jane, doesn't the water seem very low?" They were both alarmed when they noticed hundreds of salmon fingerlings flipping helplessly in the wet sand. All the pools were going dry.

"I'm heading for the dam," Hal called. He knew if they failed to save the fingerlings there would be no grown salmon in the cove for years to come. Salmon

that the world needed so badly for food must be saved!

When he reached the dam, Hal found that instead of it being dry, thousands of gallons of water were racing down the flume. In his hurry to catch the train, Jimmy had failed to close the flume gate tightly enough. This escaping water was draining the creek.

Leaning close to the pounding raceway, Hal tugged at the driftwood which was blocking the gate. "Lean over and hold me," Hal told Carl. "I'm going down."

"No," Carl answered. "You're stronger. You can hold better." He gave Hal his belt to hold. Often Hal had seen logs rushing down the flume to the mill. He knew that Carl's life was in his keeping.

Drenched by the spray, Carl fought on. When all the wood was freed, he scrambled up, and the gate fell solidly into place. The creek began to rise. Everywhere the little salmon were darting deeper into the welcome flow. Freedom had come again.

As they ate their picnic supper, Rose glanced proudly at her brother. Then she turned to Jane, her eyes shining. "This country," she said, "that brings me freedom, and where we can help also to make freedom! How I like it!"

Hal looked across at Carl. "No more than it likes you!" he said. In a very real way they had all served Canada that day. It had been the most wonderful First Hal Mason had ever known.

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>
Ending time:	_____	_____	_____
Beginning time:	_____	_____	_____

No. words $\frac{800}{\text{No. seconds}} \times 60 = \text{_____ WPM}$

COMPREHENSION QUESTIONS

- 1. How did Jimmy Black's father settle family problems?

- 2. How did Hal's family settle family problems? _____

- 3. What did the Mason children give up in order to buy War Bonds? _____
- 4. How did Rose and Carl happen to be at the Mason home? _____
- 5. What made Salmon Creek an important little stream?

- 6. What did Hal notice about the creek on the way to the picnic? _____
- 7. Why did Hal want to save the fingerlings? _____

- 8. How did it happen that thousands of gallons of water was racing down the flume? _____

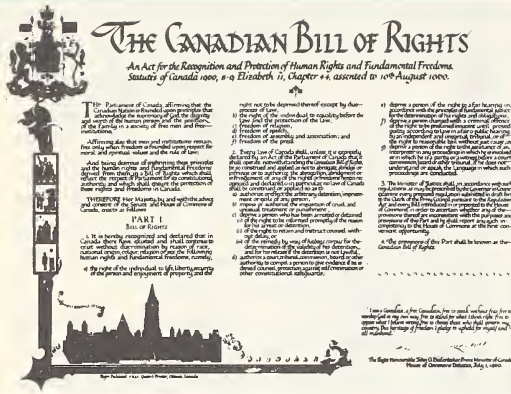
 - 9. What did Carl do to help save the fingerlings? _____

 - 10. What did Hal use to hold Carl? _____
- Comprehension score: _____ WPM: _____

DISCUSSION QUESTIONS

- 1. What did Hal's father mean when he said, "Democracy begins at home"?
- 2. In one paragraph the story tells about the fish darting about in the water and then follows the sentence: "Freedom had come again." What does this mean?
- 3. Can you find proof that Jane really did help to make this day one that would stand out in the minds of the Austrian refugees? What is the proof?
- 4. You have read stories about Randy, Kit, and Hal. In what ways were these three characters alike?

DEMOCRACY—THE CANADIAN WAY OF LIFE



In the story that you just read, Hal Mason's father often said, "Democracy begins at home." Mr. Mason believed so strongly in the advantages of democracy that he wanted his children to enjoy them from their earliest years.

What are the advantages of democracy that all of us enjoy, often without thinking much about them? Some of these advantages will be discussed in the selection below. Read to find out what they are.

1. Read the selection carefully and underline the sentence that gives the main idea in each paragraph.
2. Do Activities 1 and 2.

Any means favorable to a desired end is an *advantage* (ăd vān'tij).

When a person is free from guilt, he is said to be *innocent* (in'ô sĕnt).

If a certain thing doesn't happen very often, it is said to be *uncommon* (ŭn kôm'ŭn).

Anything that is done to make a thing better may be called an *improvement* (im prōōv'mĕnt).

WHAT ARE THE ADVANTAGES OF DEMOCRACY? *

Many of the laws and customs of Canada are based upon those of Great Britain. For centuries, the ordinary people in Britain had gained very slowly the rights to govern themselves, to speak and write freely, and to have fair trials. Many emigrants came to North America because their homeland did not give them the type of living conditions they wished. When the B.N.A. act was passed in 1867, Canada gained independence from Britain. Though the monarch in Britain was still the official head of Canada, Canada controlled her own affairs, but kept all the benefits and freedoms which had developed in Britain.

One advantage of our democracy is that there is equal opportunity for all. Everyone is free to choose the work he wants to do, to earn as much as he is capable of earning, and to invest his savings in any way that he likes. Workers have the right to belong to unions and to strike with their group for higher wages if the group thinks it should have more pay. In many countries the people have none of these rights. They have to do the kind of work the government wants them to do, and the government sets the amount of

pay which it thinks workers should have for their living expenses.

Another advantage which we enjoy in this democracy is the right to take part in the affairs of government. Every man and woman 21 years of age or over has the right to vote. We may choose from several people who are running for office the one whom we want to represent us. The governing bodies of the dominion and the provinces are made up of men and women chosen by the people. If we want a certain law passed, we have the right to send a message to the ones who are representing us at the provincial or national capital. We have the right to tell them what we would like them to do about it.

A third advantage is our freedom of religious worship. Each of us may attend any church he likes. The government doesn't interfere in any way with our religious beliefs or how we express them. In some countries everyone must attend the same church. In others, the government discourages its people from going to church or having any religious belief at all. Even to this day it is not uncommon in some countries for religious leaders to be jailed or punished in other ways.

* Based on an article prepared for this book by Enid Johnson.

Freedom to have a jury trial is another advantage which our democracy offers. A man is believed innocent until he has been judged guilty by a jury of his equals. No one can be imprisoned without a fair trial. How different is this system from that in countries in which a man may be thrown into prison or killed if the dictator so orders!

Freedom of speech is allowed in Canada. We are free to talk about the affairs of our government, to discuss its problems, and to tell how we think they should be solved. Anyone can stand on a bench in the park and give a speech on his ideas about how our government can be improved. (This privilege of course is not given to those who want to overthrow our democratic form of government by force.) In some countries anyone who dares to say that anything is wrong with the government or to make a suggestion for its improvement is punished. People dare not say one word against the government regardless of how unhappy they are in living under its control.

Another privilege which we enjoy is freedom of the press. In many countries the government controls all of the newspapers and magazines. Only that information which the government wants them to have can be given to the people. And only favorable things can ever be said in print about the government or those in charge. Our papers and magazines are free to give any information they like to our people, so long as it is founded on facts. Our press is also free to criticize a person in public office and the things that he does. A writer of a newspaper article has the right to say how he thinks some problem should be handled.

These are but a few of the advantages of our democracy. Because we are a free nation we have made the most of our resources, our energies, and our brains. That is why Canadians enjoy a good life and a high standard of living. We should work to keep our democratic form of government and to protect it. People enjoy more privileges under this form of government than any other.

ACTIVITY 1—WRITING A SUMMARY

Combine the main ideas which you underlined to make a summary. Write the summary in paragraph form and make sure that all of the main ideas are included. Don't just copy sentences from the book. Write the summary in your own words. Use a separate piece of paper.

ACTIVITY 2—HOW DEMOCRACY WORKS IN YOUR OWN COMMUNITY

Below are pictures of some things that happen to people you see often in your own community. Each picture represents one of the advantages of democracy that you have just read about. Decide which advantage each picture represents, then write a short phrase under that picture telling what the advantage is.



Applying What You Have Learned About Reading Social Studies Material

Making a summary paragraph of main ideas as you did above will often prove useful to you. You can use such a summary to refresh your memory on main points when giving a report. If you save several of these summaries you will find them very helpful to use for review purposes when studying for an examination.

If the subject you are reading about could have

any effect on your personal life today, try to reason out what that effect is. Try also to think of examples of situations in which it is applied, just as the pictures above showed examples of the advantages of democracy in your own community. Thinking of the effect which any event in *history* has on your own life today is the best way of causing reading in this field to be interesting, meaningful, and vivid.

THE STRUGGLE TO REACH SALMON CREEK



The story that you read about Hal said that he took a walk out by Salmon Creek. It also said that last year thousands of eggs had been left there by parent fish. Only fingerlings were mentioned in the story. Where were the parent fish?

The selection below will tell you about an interesting journey which parent salmon take each year. After you read this selection you will know what happened to the parent fish at Salmon Creek.

In this selection you will find directions for some experiments mixed in with paragraphs which name and describe classifications. So you will have two different kinds of reading to do in this selection.

1. Scan the selection to locate the paragraphs that tell about experiments and those that deal with classifications.

2. Read the selection carefully. (a) When you come to a paragraph giving directions for an experiment, read each direction so carefully that you can carry it out *exactly*. Think about what you might learn from the experiment, also. In other words,

When one suffers patiently, he is said to *endure* (ĕn dŭr') that which he is suffering.

When one carries something out to its end, he is said to have *performed* (pĕr fŏrmd') the action.

The process by which plants and animals give rise

to think what the experiment might prove and what conclusion or conclusions you might be able to draw from carrying it out. (b) In reading the classification paragraphs, use the same procedures which you have used before in working with classification selections. Be sure to get the *name* of each classification in mind. Then read to find out what makes that classification different from the others.

3. You may time yourself in reading this selection. It calls for careful reading, but you should do careful reading in *science* more rapidly now than when you started to work with this book.

to offspring is called *reproduction* (rĕ'prŏ dŭk'shŭn).

The name given to the process of breaking into parts is called *fission* (fish'ŭn).

The name of one family of plants is *geranium* (jĕ rā'nĭ ŭm).

Beginning time: Hr. _____ Min. _____

LIFE GOES ON*

REPRODUCTION OF SALMON

The desire to produce young, or offspring, is very strong in some living things. The salmon, for example, endure great hardships to reach the places where they can lay the eggs which will hatch into young fish. Each spring millions of salmon leave the oceans in which they live to start a dangerous journey up the fresh water streams where they were born. The salmon must swim against swift rapids, jump over falls, and face the dangers of being destroyed by fishermen and birds. Finally, tired, hurt, and starved they reach the shallow, still waters where the female lays her eggs. The male salmon then covers the many thousands of eggs with a milky substance known as

milt. This causes the eggs to develop into young fish.

Having performed the duties of reproduction, the parent fish soon die and are washed ashore. In a few months the tiny fish break forth from the eggs. They lie hidden from larger fish until they are big enough to go forth on their own. In about a year they start the journey to the open sea where they spend their adult lives. Then, after several years of life in the ocean, they in turn come back to the fresh water streams where they were born. Here they reproduce and die. In this way the life of salmon goes on and on from one generation to another, and there are always plenty of salmon in the sea for man to catch.

REPRODUCTION BY ONE PARENT

In the case of the salmon and most other animals, two parents are necessary for reproduction. Some of

* Based upon material prepared for this book by Irving Zeichner.

the most interesting forms of reproduction are those in which only one parent is necessary. A few of these will be discussed.

Fission. This is a type of one-parent reproduction which you may be able to see in an experiment.

Get three or four glass fruit jars from your mother. Go to a nearby pond or stream and fill the jars with water. Put a little mud and a few weeds from the pond in each jar also. Set these jars in a warm but not hot place. After a few days look at them carefully. You will see tiny white specks swimming around. These probably are one-celled animals. In a few days hundreds of these tiny animals will be swimming in the water. Each one of these one-celled animals has probably divided several times, making two animals each time it divides.

Try to take just one of these little animals out of the jar and place it in a glass of water. Take a little water out in a medicine dropper, and then drop just one drop that contains only one animal into the glass. Watch this animal closely and you may be able to see it in the process of dividing. By watching the clock from the time of the first division to the next, you can check the length of time it takes the animal to divide.

This process of reproduction is called *fission*. It takes place among the very tiny one-celled plants and

animals such as bacteria and amebas. The tiny cell merely pinches into two equal parts, which separate to form two new cells. There are no parent and child. Each of the cells is called a *daughter cell*, and each can divide again in a very short time. Some of the cells divide every eighteen to twenty-four hours.

Budding. Another simple process of reproduction is known as *budding*. In this process a little bump, or bud, may push out of the body of some simple thing such as the yeast plant or animal sponge. Eventually this bud breaks off to form a new plant or animal. The same plan is used in reproducing potatoes. The farmer cuts potatoes into pieces, each of which has an "eye" or bud. When these pieces are planted, a potato plant grows from each one of the "eyes" or buds.

Layering. This type of reproduction is used sometimes in reproducing berry plants. In using this type of reproduction a long stem is bent down to the ground and covered with soil. This stem then roots and sends up leaves, making a new raspberry bush.

Grafting. This method of reproduction is frequently used in growing fruit trees. In grafting, a twig of one fruit tree is set into another young fruit tree with hardy roots. The grafted twig grows and bears the fruit of the tree it came from, even though growing from the trunk or branch of another tree.

	<i>Hr.</i>	<i>Min.</i>	<i>Sec.</i>	
Ending time:	_____	_____	_____	No. words <u>768</u> × 60 = _____ WPM
Beginning time:	_____	_____	_____	No. seconds _____

ACTIVITY 1—GIVING A REASON

Why were there no parent fish in Salmon Creek? _____

ACTIVITY 2—MAKING A CHART OF CLASSIFICATIONS AND THEIR DIFFERENCES

In each of the top spaces of the chart below write the name of one method of one-parent reproduction. In the space below each method named, write one or more statements showing how this method is different from the others.

<i>One-Parent Reproduction</i>				
Method				
Differences				

Your teacher will tell you how to score your comprehension. Comprehension score: _____ WPM: _____

ACTIVITY 3—RESTATING AN EXPERIMENT AND DRAWING CONCLUSIONS

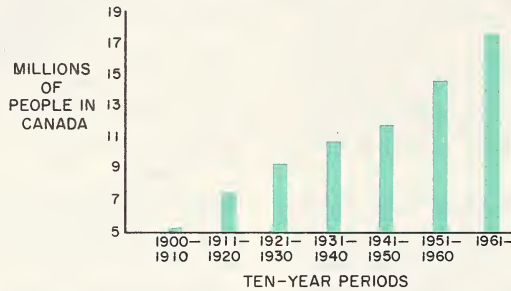
Tell *exactly* how you would carry out the experiment in observing the one-celled animal. List the **two conclusions** that you might draw from this experiment. Use a separate piece of paper.

REVIEWING SOME OF YOUR READING SKILLS IN MATHEMATICS

This page is a review and a test. You have had practice in using reading skills needed in reading graphs, and in reading and solving ordinary problems, formulas, and algebraic equations. You will

now have a chance to show how well you can apply these reading skills. Use the procedures you have learned in this book, to solve each of the other three problems below.

Graph *



The above graph shows the number of people in Canada at the end of ten-year periods:

1. How many millions were there by 1961? _____
2. During which of the periods was the increase greatest? _____
3. During which period was the increase the smallest? _____
4. During which period was there the greatest rate of increase? _____

Problem

If a given salmon lays about 10,000 eggs and approximately 15 per cent of the eggs develop into young fish, about how many young fish would this salmon produce?

To find: _____

Given: _____ Estimate: _____

Process: _____ Answer: _____

Formula

The very important fact that “the distance travelled can be found by multiplying the rate of speed by the time travelled” is represented by the formula $D = rt$. Use the formula to find how far a fish can travel in 3 days at an average speed of 8 miles an hour. (*Clue: Change the 3 days to hours before using the formula.*)

Formula: _____

Substitution: _____

Answer: _____

Equation

A certain number of cells multiplied by 2 equals the 128 cells produced by a simple cell division. What was the original number of cells?

Equation: _____ Answer: _____

* Graph and problems prepared for this book by Donald Lentz.

MAKING GENERALIZATIONS

Many paragraphs contain a series of related facts about one subject. Sometimes you need to remember each of these separate facts. At other times all you need to do is to get a general idea of what the several facts imply when taken together. The gen-

eral conclusion which you draw from several facts is called a *generalization*.

See if you can make a generalization after reading the facts in each paragraph below. The first generalization has been written for you.

1. Perhaps you think pilots and stewardesses are the only type of workers employed by an airline. If you should visit an airport you would see ticket agents, secretaries, typists, and bookkeepers—all at work on the airline's business. Then there are the highly skilled mechanics who keep the planes in good flying condition. Cargo handlers take care of the mail-boxes, express, and baggage. A superintendent works with the pilot of each plane to plan his route and altitude. Radio operators direct take-offs and landings.

What generalization can you make about the employees of an airline? *Many different workers are employed by an airline.*

2. Corn is grown from southern Canada throughout the United States and Mexico. In South America, corn is found from the northern part of the continent to Argentina. Corn grows in Europe from the central part of that continent to the northern part of Africa. It is raised in the southeastern part of Asia. And cornfields are found also in the southeastern part of Africa.

What is your generalization in regard to places where corn is grown? _____

3. Montreal, the largest city of Canada, lies at the highest point of the St. Lawrence River to which ocean ships can sail. Of the five largest cities of Canada, four are situated beside the sea or on the shores of one of the Great Lakes. Of the 125 largest cities in the world, 80 can be reached by ocean steamers and 7 by boats sailing the Great Lakes of North America. Of the remaining 38, 27 are situated on large navigable rivers such as the Mississippi, Danube, Vistula, and Nile. Only 11 are completely without communication by water.

What is your generalization concerning the location of large cities? _____

4. In oceans you find large animals such as whales and porpoises. There are many different kinds of fish. Snails, clams, lobsters, crabs, and eels live in the sea. These animals are large enough so that a person can see them with the naked eye. But there are also hundreds of animals in the sea that can not be seen without a microscope. Oceans are filled with plants as well as animals. There are seaweeds of many different kinds. And there are hundreds of tiny plants too small to be seen unless we use a microscope.

What generalization would you make about things that live in the sea? _____

5. Some seeds are scattered by the wind. The white head of the dandelion is made up of seeds with a parachute attached to each one. Some seeds have wings which help them to "fly" through the air. Seeds of the maple, ash, thistle, and milkweed have wings. Water also helps to scatter seeds. The seeds of grass, the sycamore, and the bitter pecan are light enough to float in water. They fall into streams and are carried along with them. Some seeds stick to animals and plants and are carried from place to place in this way. Some plants scatter their own seeds. When their seed pods are ripe they burst open with such force that their seeds are scattered for quite a distance.

What generalization can you make in regard to the ways in which seeds travel? _____

READING KEY WORDS ONLY

Did you ever read with the use of key words only? This procedure is useful in reading easy material just for entertainment or in reading any material for general, over-all information. In using the key word procedure you skip over the unimportant words and read only nouns, verbs, and an occasional phrase.

The unimportant words have been left out of the selection below. Read the key words that are given. Then check yourself with the test on the lower part of the page. No doubt you will be surprised to find how much information you can get by reading *only* key words.

A Fish That Builds Its House *

Everyone knows . . . bears sleep . . . caves . . . hollow logs . . . winter. But . . . hardly expect fish . . . hibernate. Yet . . . fish . . . goes . . . bear one better. Not only . . . sleep but builds . . . sleeping place. . . . fish . . . builds a house . . . African lung-fish. . . . lives lakes . . . streams . . . Africa, chiefly . . . banks . . . marshy places. . . . strange-looking creature, . . . two pairs . . . limbs . . . powerful tail. . . . lungs as well as gills. . . . able . . . breathe as well out . . . water . . . in it.

During . . . rainy season Mr. . . . swims . . . as gaily . . . other fish. But . . . rains cease, . . . sets . . . work . . . house. While ponds . . . streams . . . drying up, . . . digs hole . . . eighteen inches deep. . . . curls . . .

bottom . . . , shape . . . fish hook. . . . sends out a slime . . . fills hole . . . protects . . . from mud. . . . leaves . . . hole . . . to breathe.

Until . . . rains fall . . . sleeps. . . . lives upon his fat. When streams fill . . . dwelling dissolves . . . comes . . . thin . . . hungry.

In spite of . . . cleverness . . . protecting self, . . . not always survive. . . . cunning . . . causes . . . undoing. . . . natives . . . find . . . him. Knowing . . . habits, . . . chop . . . home and all, . . . store . . . until needed.

At times . . . blocks . . . mud . . . shipped . . . England . . . America. Upon arrival . . . put . . . tank . . . warm water. . . . fish . . . appears . . . undisturbed . . . journey.

Write your answer to each of the questions below without looking back at the article.

1. What is this fish called? _____
2. What does he do that is unusual? _____
3. Why is he strange-looking? _____
4. Why can he breathe out of water? _____
5. When does he begin to work on his house? _____
6. How deep is the hole that he makes? _____
7. How does he protect himself from the mud? _____
8. What does he live on while in the hole? _____
9. What do the natives sometimes do to him? _____
10. What happens upon his arrival when this fish is shipped to America or England in his block of mud? _____

* "A Fish that Builds a House," *The Mentor*, February, 1922, p. 44. (No author named.)

SKIMMING WITH THE USE OF KEY WORDS

Now see if you can use the key word procedure when the unimportant words are left in the selection.

The selection below describes Paul Kane, a painter and friend of the Indians. From his paintings and the accounts in his diary, we know a great deal about how Indians lived in the last century. The information in this article, though containing many interesting facts, is not of the type that you will want to remember in detail, as you would facts in history.

Nor is it a scientific explanation that is difficult to understand. You probably can find out all you care to find out by skimming this article.

Sweep your eyes over the lines as rapidly as possible, reading only key words and skipping all others. Pay no attention whatever to the unimportant words. Pretend they are simply blank spaces as they were in the article on page 126. Read only the words you absolutely need in gathering the basic meanings.

Paul Kane—Artist and Adventurer

Paul Kane was not only one of Canada's earliest painters but also a remarkable traveller and notable writer.

He was born in County Cork, Ireland, on September 3, 1810, but, when Paul was eight or nine years old, his family came to Canada and settled in the muddy little town of York, now Toronto. He was more interested in the Indians who camped on the outskirts of the town than in his lessons at the local grammar school, but it was here that he received his first instruction in drawing.

Kane left school when he was sixteen and for several years worked in a furniture factory. Already, however, he burned with a passionate ambition to paint a series of pictures of the North American Indians in their natural surroundings.

Having earned a little money by painting portraits, Kane left Toronto in 1836 for the United States. Eventually, although he was always short of money, he was able to sail to Europe, where he visited all the

famous art galleries of Italy, France, and Britain and studied the works of the greatest painters.

He returned to Toronto in 1844, and in 1846 was given a commission by Sir George Simpson, Governor of the Hudson's Bay Company, to paint twelve pictures of Indian buffalo hunts, camps, councils, feasts, and dances. Kane's small party travelled largely by canoe, via Fort Garry and Fort Edmonton, across the great prairies, where buffalo still roamed and Indians carried on their traditional warfare. Kane's ability to produce portraits made many Indians regard him as a great medicine-man. Leaving Jasper House in the Rocky Mountains, he endured a terrible journey over the Athabaska Pass in subzero weather.

However, he returned safely to Toronto in 1848 with a journal of his adventures and a fascinating collection of more than five hundred sketches, upon which he worked until, in 1866, his eyesight began to fail; he believed that his eyes had been damaged during his journeys by the glare of the sun on snow.

Now see how much you got out of this article while skimming it with the use of key words. Write your answers to these questions without rereading the article.

1. In what country was Kane born? _____
2. How old was he when he came to Canada? _____
3. Where did his family settle? _____
4. Where did he work after leaving school? _____
5. What was always his ambition? _____
6. Why did Kane visit Europe? _____
7. Who gave Kane the commission? _____
8. What was the chief method of transport on his journeys? _____
9. Why was he regarded as a great medicine-man by many Indians? _____
10. What reason did he give for the damage to his eyesight? _____

CRITICAL READING

Critical reading is the kind of reading that we do when we think critically about what we are reading. In doing critical reading we seek deeper meanings. We try to decide what is fact and what is opinion. We reason, question, and seek proofs. You have done a great deal of critical reading in this book. Become familiar with the term *critical reading*.

Read the selection below critically. Question statements as you go along. Try to decide for yourself whether the experiences that are described are possible, and if not, why not.

Don't try to skim this selection. Critical reading must be done slowly and thoughtfully, so do not try to read the selection for speed.

Visitors from Other Planets

George Adamski has written a book called *Inside the Space Ships*.^{*} In this book he claims that visitors from outer planets call on him. He says they are friendly people and are eager to help us Earthlings.

According to Mr. Adamski, thought messages direct him to the place where he can meet spacemen. He says that they often meet in a hotel lobby.

Sometimes they go to a restaurant and have coffee and sandwiches. Then they get into a black sedan and drive away. Finally they reach a place where a spaceman scout is waiting with a strange craft. They get into the craft and are quickly swept up to an altitude of something over one hundred thousand feet.

Here the main ship is waiting for them. This main ship is a superliner. It has a large lounge something like those of our steamships. People are sitting and talking in this lounge. The women are the loveliest he has ever seen, and the men are the handsomest that he has ever seen. But they are not proud and do not seem to feel superior to the Earthman.

They welcome him and are very friendly. He is offered a chair unlike any furniture ever seen on earth. He then sits down to listen. As he listens he hears words of wisdom spoken by a great master. This master is a hundred times older than Adamski but he doesn't show his age.

ACTIVITY 1—THINKING CRITICALLY ABOUT WHAT YOU READ

Write your answers to these questions. Think carefully before you answer each one.

1. Do you think a scientist wrote this book? _____ Give the reason for your answer. _____
2. Do we know for sure that there are human beings on the other planets? _____
3. If there should be inhabitants on other planets, would they be apt to look like highly perfected earth people? _____
Give the reason for your answer. _____
4. Do you think people from another planet would enjoy eating cake and drinking coffee? _____ Why? _____
5. Where do you think the black sedan came from? _____ What happened
it when they went up in the craft? _____
6. Where do you think the writer got his idea about the lounge in the space ship? _____
7. What about the language? Do you think that people from another planet would talk the same language that we do? _____
Give a reason for your answer. _____
8. What proof would you want to convince you that the author really is having these experiences with spacemen? _____
9. If he did not really have these experiences, what might have been his purpose in writing the book? _____

^{*} Adamski, George, *Inside the Space Ships* (New York: Abelard-Schuman, Inc., 1956).

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